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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ORIGINAL ARTICLES

The Pathogenesis of Rheumatic Fever — D. A. LONG, M.D. 529
Sympathectomy by the Axillary Approach — H. J. B. ATKINS, F.R.C.S. 538
Streptomycin Reactions — H. R. C. RICHES, M.R.C.P. 540
Corticotrophin Zinc Phosphate and Hydroxide — J. D. H. HOMAN, PH.D., G. A. OVERBEEK, PH.D., J. P. J. NEUTELINGS, C. J. BOOIJ, J. VAN DER VIES 541
Corticotrophin Zinc Phosphate — RAYMOND GREENE, M.R.C.P., JOSEPHINE VAUGHAN-MORGAN, B.SC. 543
Corticotrophin Zinc Phosphate — D. G. FERRIMAN, M.R.C.P., A. B. ANDERSON, M.R.C.S., P. P. TURNER, M.R.C.P. 545
Corticotrophin Zinc Phosphate — S. A. DEN OUDSTEN, M.D., L. VAN LEEUWEN, R. J. COERS 547
A Convenient Apparatus for Providing Controlled Hypothermia — J. McN. INGLIS, F.F.A. R.C.S., W. H. BIFFEN, L.I.B.S.T., A. L. D'ABREU, F.R.C.S. 549
Thorn's Syndrome Following Excessive Ingestion of Alkalis — A. I. CHEYNE, M.D., T. P. WHITEHEAD, F.R.I.C. ... 550

MEDICAL SOCIETIES

Royal Society of Medicine: Nutrition of the Surgical Patient 552

NEW INVENTIONS

Injection Set for Arteriography in the Limb — C. J. LONGLAND, F.R.C.S. 553

REVIEWS

Notices of Books 553

IN ENGLAND NOW

A Running Commentary by Peripatetic Correspondents 569

LEADING ARTICLES

FULL-TIME—PART-TIME 555
SELECTIVE PITUITARY FAILURE .. 556
MEN AGAINST WORMS 557

ANNOTATIONS

Medicine in the Royal Navy 558
The United Nations and World Population 558
Gamma-globulin in Poliomyelitis 558
The Mental Health Research Fund 559
Systemic Lupus Erythematosus .. 559
Shock Treatment and Psyche 560
Tendon Lesions in Rheumatoid Arthritis 561

SPECIAL ARTICLES

Cost of the National Health Service 562

THE WIDDICOMBE FILE

IX. The Best Job in the World ? 566

LETTERS TO THE EDITOR

Patient's Consent (Dr. Robt. Forbes) 570
Salaries of Whole-time Specialists (Dr. Leo Gilchrist; Dr. F. A. Bleaden) 570
Shortage of Hospital Beds (Dr. Eric Frankel) 571
Congenital Pneumonia (Dr. G. R. Osborn) 571
Poliomyelitis in Children's Wards (Prof. J. Trueta, M.D.) 571
Treatment of Deafness (Mr. Ian Robin, F.R.C.S.) 572
Myxœdema Attributed to Iodides (Dr. I. Freed) 572
Ordinary Youths (Dr. William Hunter) 572
Hypersensitivity to Penicillin (Dr. M. Salib) 572
Erythema Infectiosum (Dr. C. A. H. Watts) 573
Spinal Traction (Dr. Alan Stoddard) 573
Treatment of Aneurysms (Prof. Charles Rob, F.R.C.S., Mr. H. H. G. Eastcott, F.R.C.S.) 573
Sanarelli-Shwartzman Reaction (Dr. F. E. Weale) 574
Poliomyelitis and Inoculations (Prof. A. Bradford Hill, D.SC., Dr. J. Knowelden) 574
Pneumoconiosis (Dr. K. Triger) .. 574
Toxoplasmosis (Mr. F. I. Awad, B.V.SC., Mr. R. Lainson, B.SC.) .. 574
Apparatus for Sterilising Loops (Dr. W. H. Hughes) 575
Overdose of Intrathecal Streptomycin (Dr. Gerald Slot) 575
The Third Fontanelle (Dr. A. W. Franklin) 575
Shoe Design and the Great Toe (Dr. Margaret Emslie; Mr. Henry Rosenstein, F.CH.S.) 575
Hexamethonium in Ulcerative Colitis (Dr. P. Jabkovitz) 576

PARLIAMENT

Diesel Exhaust Gases 567
Question Time 567

PUBLIC HEALTH

Paratyphoid in Cardiff 568
Population Estimates 568
"A Municipal Hospital Service" 568
Infectious Diseases in England and Wales 568

MEDICINE AND THE LAW

An Unusual Experiment 576
Death after Drinking Anti-freeze Liquid 576
No Beds Available 576

OBITUARY

Norman Gerald Horner 577
Lewis Ralph Yealland 577
Herbert Alfred Brittain 578
Elinor Dorothy Stopford Price .. 578
Charles Montagu Power 579
Dame Grace Kimmins 579

NOTES AND NEWS

Rheumatoid Arthritis and the Patient 580
Guy's Hospital Dental School 580
Smokeless Fuels 580
The Brother Tongue 580
Transfusion Risks 581

Diary of the Week 582
Appointments 579
Births, Marriages, and Deaths ... 582

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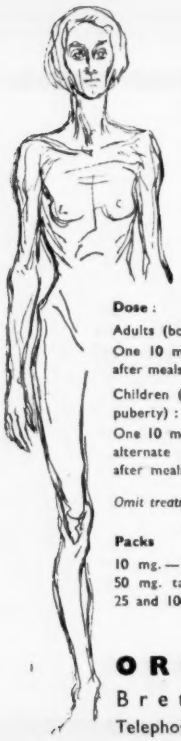

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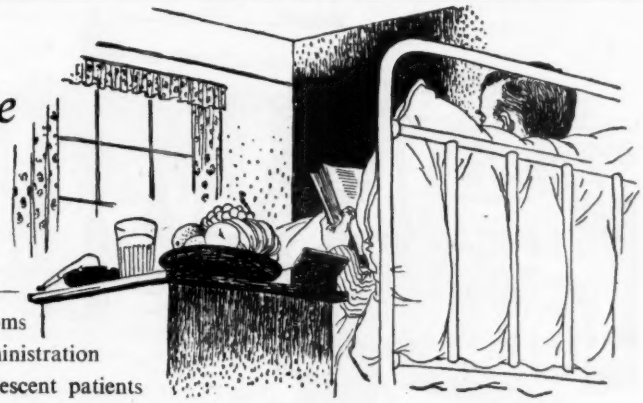

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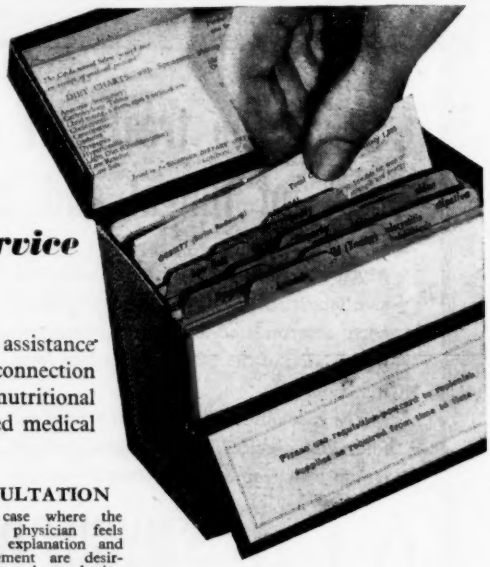

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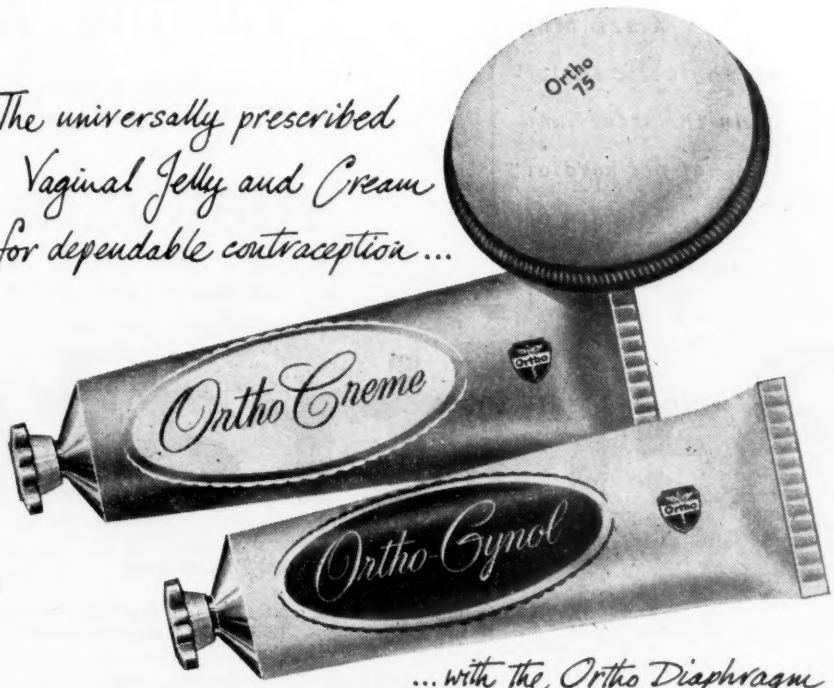

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* Ricinoleic acid and p-Diisobutylphenoxypolyethoxyethanol in a synthetic base buffered at pH.4.5

LITERATURE ON REQUEST

Ortho Pharmaceutical Limited

Ortho

HIGH WYCOMBE · BUCKINGHAMSHIRE · ENGLAND

A new oral prophylactic tablet in the treatment of pre-cordial pain of angina pectoris:

Peritrate

TRADE MARK
brand of Pentaerythritol Tetranitrate

A coronary vasodilator, active ½ an hour after swallowing and effective for 4 to 5 hours. Each tablet is of 10 mg. strength.

Peritrate is a drug of considerable benefit in the prophylactic treatment of patients with coronary insufficiency, regardless of their age. The evidence of clinical trials indicates that in some cases Peritrate may protect completely against attacks; in others, the number of attacks is substantially reduced; while those attacks not prevented may be less intense and of shorter duration. Results so far obtained with Peritrate suggest that it is more efficacious than drugs such as aminophylline or khellin; also there are certain other beneficial effects which can be expected:

1. Less palpitation, especially at night.
2. Shortness of breath on effort, less severe.
3. An improvement of 50 per cent in distance walked.
4. Reduction of nitroglycerin requirement.
5. The negative S-T segment shifts, ordinarily occurring after exercise, modified; Peritrate has returned the abnormal resting electro cardiogram towards normal in a significant number of cases.

DOSAGE 4 to 8 tablets (40 to 80 mg.) as required.
PACKING Bottles of 50 and 500 tablets.

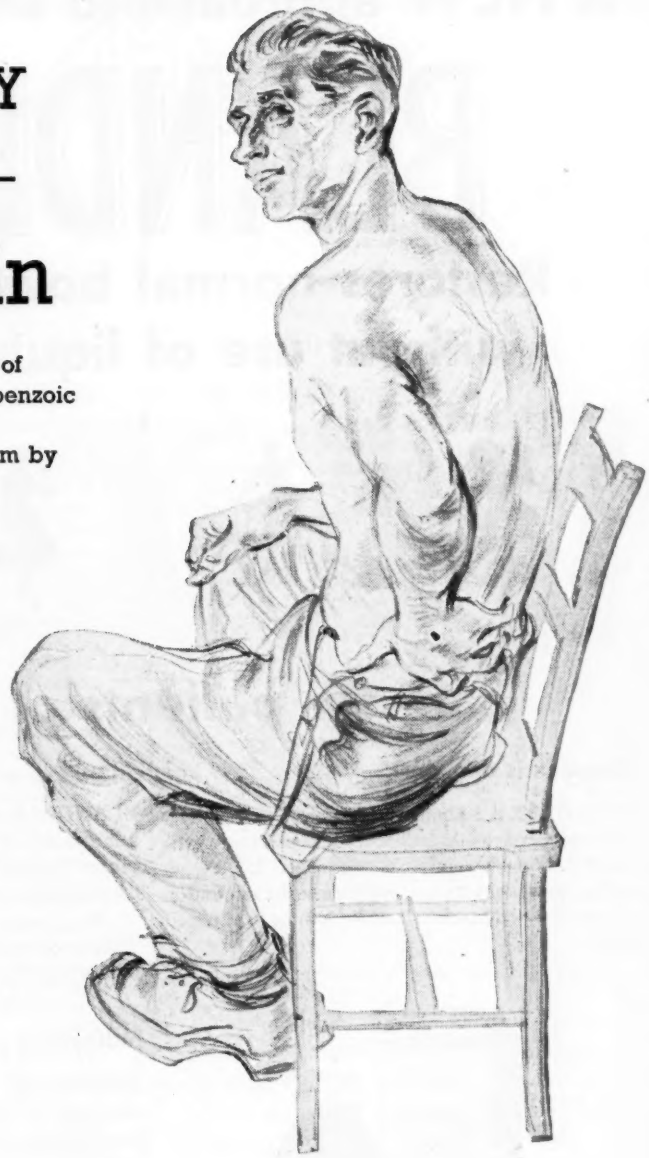
CHILCOTT *Laboratories Ltd.*

Sole Distributors: William R. Warner & Co. Ltd., Power Road, London, W.4

NOW WIDELY PRESCRIBED—

Transvasin

Contains skin-penetrating esters of salicylic, nicotinic, and p-aminobenzoic acids. It brings real relief to deep-seated muscular rheumatism by simple inunction.



Transvasin, a new preparation developed by Hamol S.A., our Swiss associates, and now available for prescription in this country, contains polar *esters* of salicylic, p-aminobenzoic and nicotinic acids. These esters readily pass the skin barrier in therapeutic quantities and enable an effective concentration of the drugs to be built up where they are needed. Transvasin not only induces vasodilation of the skin with a superficial erythema but also brings about a deep hyperaemia of the underlying tissues. It is non-irritant, and can be safely used on the skin.

It is now being widely prescribed, with highly successful results. There is evidence, also, that since a very small quantity is sufficient for each application the cost of treatment is extremely low.

Salicylic acid tetrahydrofurfuryl-ester	14%
Nicotinic acid ethyl-ester	2%
Nicotinic acid n-hexyl-ester	2%
p-Aminobenzoic acid ethyl-ester	2%
Water-miscible cream base ad	100%

Transvasin is available in 1 oz. tubes at 3/4½ plus 7½d P.T., which are obtainable on form E.C.10, and is not advertised to the public.

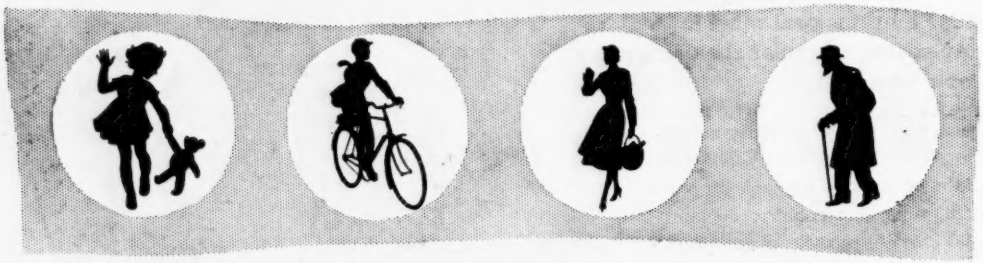
Samples and literature will be gladly sent on application.

LLOYD-HAMOL LTD. 11 WATERLOO PLACE, LONDON, S.W.1 ***WHItehall 8654/5/6***

A NEW approach to an old problem

BLANDLAX

Restores normal bowel function without use of liquid paraffin



Safe for patients of all ages

Blandlax is efficient

BLANDLAX is a liquid preparation of prehydrated sodium carboxymethylcellulose, incorporating a sub-laxative dose of magnesium hydroxide. It prevents undue faecal dehydration, encourages the restoration of normal bowel function, and is soothing to inflamed mucosa.

Blandlax is safe

BLANDLAX is not habit forming; it contains no mineral oil or purgative and, therefore, cannot cause "leakage" or griping. It is devoid of the disadvantages associated with the administration of dry preparations of carboxymethylcellulose. With its agreeable flavour and creamy consistency, BLANDLAX is pleasant and easy to take.

Indications

BLANDLAX is specifically indicated in the treatment of constipation associated with colitis, hæmorrhoids, pregnancy, peptic and duodenal ulcer, etc.

Supplied in bottles of 8 fl. oz. 16 fl. oz. & 80 fl. oz.
Retail prices 2/6d., 4/6d. and 18/-.

All subject to the usual discounts.

Descriptive literature obtainable from The Medical Department Boots Pure Drug Co. Ltd. Nottingham, England

Boots

S 195

HOMMEL

HICOSEEN REGD.

HOMMEL

A new highly effective expectorant with reliable sedative action

'Hicoseen' provides for the first time a new chemical entity—*2-Diethylaminoethyl-phenylethyl acetate*—which has been shown on clinical investigation to be a distinct advance in serving the basic requirements of anti-tussic therapy.

ACTION

Published reports confirm that 'Hicoseen' can inhibit *cough irritation* promptly; *liquefaction* and *expectoration* are noteworthy features; it has an excellent *sedative effect*; the new component is shown to possess high antispasmodic activity in experimental studies.

ADVANTAGES

'Hicoseen' does not induce side-effects. Unlike morphine alkaloids the new agent in it does not affect the respiratory centre. The content of codeine phosphate is small, thereby permitting wide dosage latitude.

FORMULA

2-Diethylaminoethyl-phenylethyl-acetate (HH105) . . . *0.015 gm.*
Codeine phosphate . . . . . *0.012 gm.*
Guaiacol albuminate . . . . . *0.800 gm.*

DOSAGE

Adults: 2 to 4 dessertspoonfuls daily; in cases of cough irritation, 1 teaspoonful on each occasion up to 10 teaspoonfuls daily. Children: according to age and number of cough paroxysms 3 to 5 tea- or dessertspoonfuls daily.

PACKS

Bottle of 4 fl. oz.; 16 fl. oz. for dispensing.

NYXOLAN REGD.

HOMMEL

Entirely non-toxic anthelmintic in oxyuriasis

Unlike older anthelmintics such as piperazine hydrate and dye substances, the active agent in 'Nyxolan' is absolutely non-toxic, non-staining and free from dangerous or nuisance-producing effects.

'Nyxolan' provides up to 90% cure rate against threadworms. Clinical trials show that it is effective without supportive purgation.

ADVANTAGES

'Nyxolan' is not a dye; it is non-arsenical. It does not induce diarrhœa or other side-effects. In contrast to piperazine hydrate it has never provoked published reports of toxic damage. It is entirely acceptable, even to infants.

FORMULA

Active ingredient:
Aluminium 8-hydroxyquinoline sulphate $[Al(C_9H_6ON)_3 3H_2SO_4.]$
Syrup *0.4%*
Dragées . . . . . *120 mg.*

PACKS

'Nyxolan' is presented in syrup form suitable for children: Standard Bottle of 8 fl. oz.

'Nyxolan' Dragées: 60's and 600's (dispensing).

Dosage and Hygienic Instructions with each pack.

AVAILABLE ON THE N.H.S.

PROFESSIONAL SAMPLES & LITERATURE ON REQUEST

HOMMEL'S HÆMATOGEN & DRUG CO.,
121 Norwood Road,
London S.E.24

'HOMMEL' ethical range includes:—

DORMUPAX • HICOSEEN • HYPERYSIN • NYXOLAN • TRISAN

Where untilled soil tells of malaria

While world population mounts, food production lags behind. Yet crops could be abundantly increased in many areas if malaria were effectively controlled. Encouraging reports on 'Daraprim' suggest that this new drug can play a major part in eradicating the disease. Highly potent, tasteless, virtually non-toxic, 'Daraprim' has proved an excellent suppressant in a weekly dosage of 25 mgm. It is issued as compressed products of 25 mgm., in packs of 6, 30 and 1000.

'DARAPRIM'

PYRIMETHAMINE BRAND

Issued in France and the French Empire as 'Malocide' brand Pyrimethamine

BURROUGHS WELLCOME & CO. (The Wellcome Foundation Ltd.) LONDON

Associated Houses: NEW YORK · MONTREAL · SYDNEY · CAPE TOWN · BOMBAY · BUENOS AIRES · CAIRO · DUBLIN

For wide-range choice

of administrative forms...

Every recognized and commonly used means of PAS administration is made available through one or other of the various forms of 'Aminacyl' brand of Calcium PAS or of Sodium PAS B.P.

Cachets

Cryst. Ca or Na PAS: 1.5 g., 100's and 500's; 2.0 g., 80's and 400's.

Granulate

Cryst. Ca PAS: 100 g., 400 g., 2,000 g. packs

Dragées

Cryst. Ca or Na PAS: 0.4 g., 0.5 g., 0.75 g., 250's and 1,000's.

Dry Ampoules

1 and 6 × 2.41 g. crystal. = 2.0 g. Na PAS anhyd.

Solution Ampoules

Na PAS: 20% topical; 2.8% (isotonic) ophthalmic.

Bulk Powder

Cryst. Ca or Na PAS: 100 g., ¼, ½, 1 and 5 kg.

Intravenous

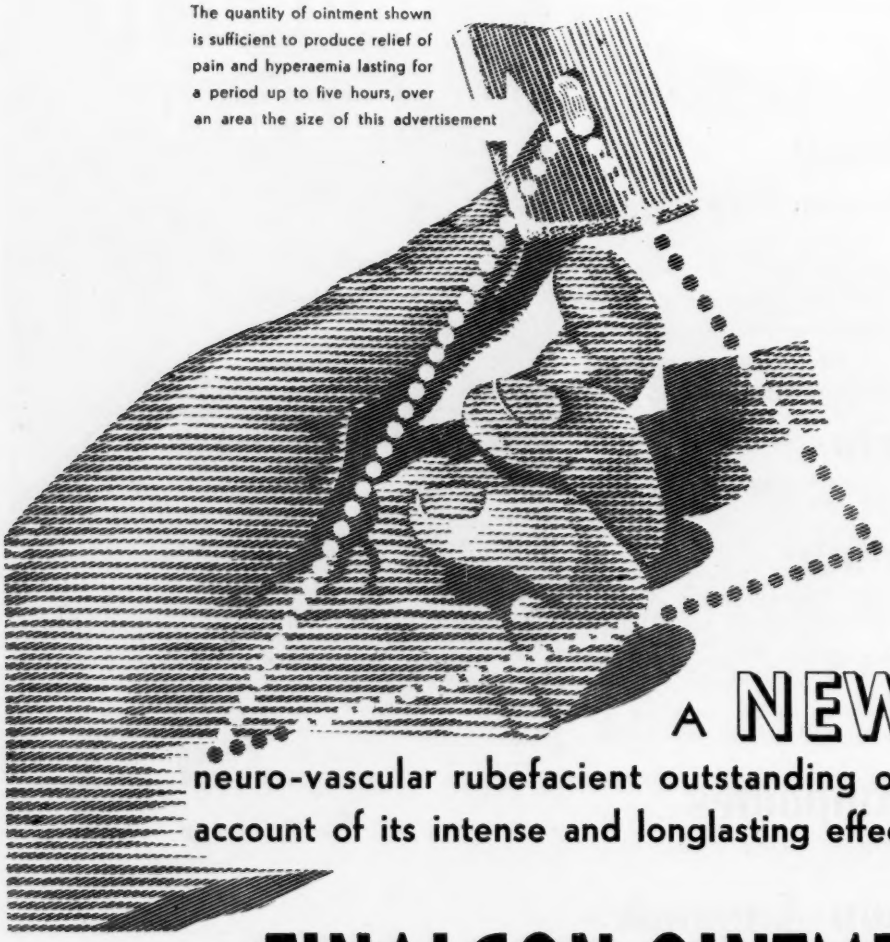
Purified crystalline Na PAS for I.V. solutions; bottle of 250 g.

Further information from the Medical Dept.,
A. WANDER LIMITED,
42 Upper Grosvenor Street,
Grosvenor Square, London W.1.

CANADA: A. Wander Ltd., Peterborough, Ontario.
AUSTRALIA: A. Wander Ltd., Devonport, Tasmania.
NEW ZEALAND: A. Wander Ltd., Christchurch.
INDIA: Grahams Trading Co. (India) Ltd., 16 Bank Street, Bombay.
PAKISTAN: Grahams Trading Co. (Pakistan) Ltd., P.O. Box 30, Karachi.
CEYLON: A. Baur & Co. Ltd., Colombo.

M.374

The quantity of ointment shown is sufficient to produce relief of pain and hyperaemia lasting for a period up to five hours, over an area the size of this advertisement



A NEW

neuro-vascular rubefacient outstanding on account of its intense and longlasting effect

FINALGON OINTMENT

Nonylic acid vanillylamide 0.4% and Nicotinic acid-β-butoxyethyl ester 2.5% in a suitable ointment base (packed in tubes of 20 g.)

for the treatment of all types of rheumatic conditions

LEWIS LABORATORIES LTD., LEEDS

For the distressed and anxious patient

'DRINAMYL'

One tablet t.i.d. after meals

'Drinamyl' produces a mood of calm cheerfulness, free from the drowsiness and dull-wittedness sometimes caused by barbiturate therapy. 'Drinamyl' helps the anxious patient to face his worries with tranquillity and optimism.

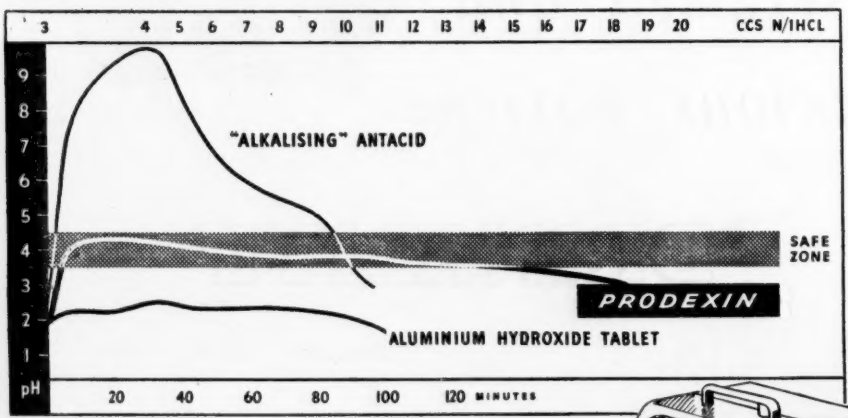
Each 'Drinamyl' Tablet contains 5 mg. 'Dexedrine' (dextro-amphetamine sulphate) and 32 mg. (gr. ½) amylobarbitone. Issued in containers of 50.

MENLEY & JAMES, LIMITED, COLDHARBOUR LANE, LONDON, **S.E.5**

DLP14 *for* Smith Kline & French International Co., owner of the trade marks 'Drinamyl' and 'Dexedrine'

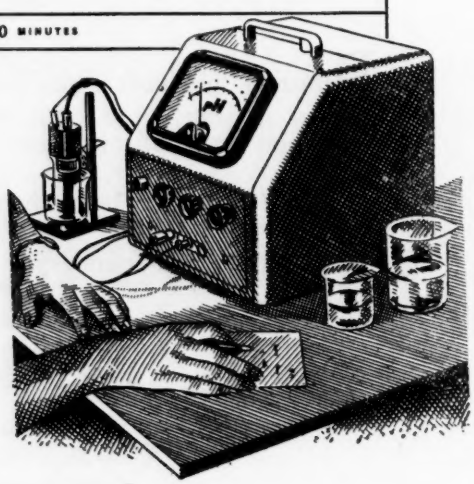
A New development providing *CONTROLLED* antacid therapy

Prodexin is a new product containing aluminium glycinate, and belongs to the buffer group of antacids. It depends for its action upon the slow release, on hydrolysis, of active aluminium hydroxide gel and glycine (amino acetic acid). Glycine rapidly raises the pH to 2, sparing the aluminium gel for the later stage of raising it into the "safe zone" of pH 3·5 to 4·5. Prodexin maintains an equable gastric environment for long periods without alkalisation.


3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 CCS N/1HCL
9 8 7 6 5 4 3 2 1 pH
"ALKALISING" ANTACID
SAFE ZONE
PRODEXIN
ALUMINIUM HYDROXIDE TABLET
20 40 60 80 100 120 MINUTES

Prodexin provides a convenient, economical and safe treatment for HYPERACIDITY and PEPTIC ULCER.

The tablets, sucked one at a time, maintain the pH of the stomach contents within the "safe zone" for up to two hours. With Prodexin there is no risk of acid rebound or alkalosis. Prodexin tablets are pleasant to suck and they do not form gritty particles in the mouth or give rise to constipation.



PRODEXIN

Each tablet contains:—

Aluminium glycinate.....0·9 gramme.
(*dihydroxy aluminium aminoacetate*)
Light magnesium carbonate.....0·1 gramme.

The basic N.H.S. cost of treatment at the rate of 6 Prodexin tablets daily is 8½d.

Manufactured in the laboratories of

C. L. BENCARD LIMITED

MINERVA ROAD · PARK ROYAL · LONDON N.W.10

BENCARD

RAUDIXIN

The safe hypotensive agent for oral administration

RAUDIXIN Tablets contain the standardised root of the Himalayan plant, *Rauwolfia serpentina*, which produces mild, gradual fall of arterial pressure.

Literature and samples gladly sent on request.

SQUIBB

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19

THE DISTILLERS COMPANY
(Biochemicals) Limited

COMBINED ATTACK . . .

'DISTAVONE'
brand

procaine penicillin G
potassium penicillin G
dihydrostreptomycin sulphate

Not infrequently, cases of advanced infection or of mixed infection require immediate treatment and to await proper bacteriological examination may be quite impracticable or inadvisable. In such cases, and also in prophylaxis in certain operative procedures, it is often the practice to administer separate injections of penicillin and dihydrostreptomycin.

'Distavone' offers a more convenient method of administering these antibiotics in such instances.

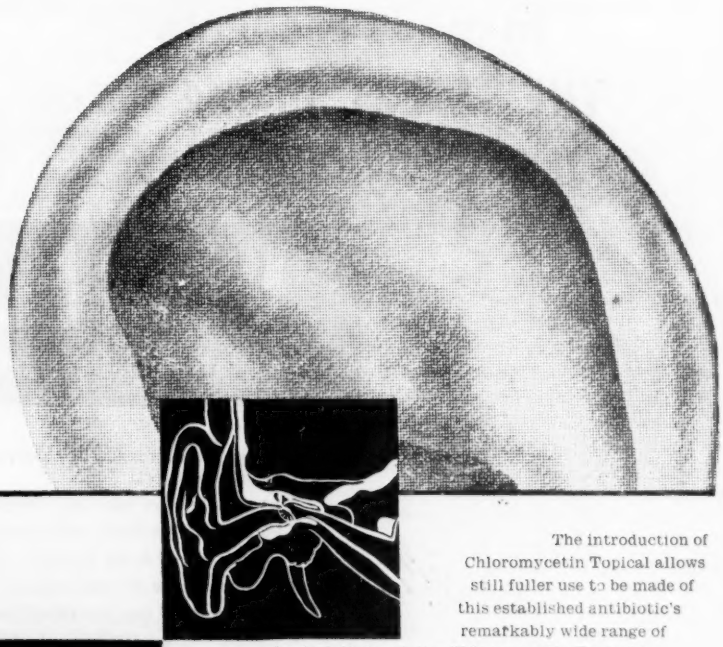
Each single-dose injection-type vial contains 300,000 units procaine penicillin G, 100,000 units potassium penicillin G and the equivalent of 0.5 gramme dihydrostreptomycin base (as sulphate).

Distributed by:

ALLEN & HANBURYS LTD.
BRITISH DRUG HOUSES LTD.
BURROUGHS WELLCOME & CO.
EVANS MEDICAL SUPPLIES LTD.
PHARMACEUTICAL SPECIALITIES (MAY & BAKER) LTD.

Manufactured by THE DISTILLERS COMPANY (BIOCHEMICALS) LIMITED, SPEKE, LIVERPOOL.
owners of the trademark 'Distavone'

16/54



Introducing

CHLOROMYCETIN *topical*

a noteworthy advance
in the treatment of

EAR AND WOUND INFECTIONS

The introduction of Chloromycetin Topical allows still fuller use to be made of this established antibiotic's remarkably wide range of bactericidal activity. Chloromycetin Topical is advocated in the treatment of chronic otorrhœa, suppurative otitis media and infections of fenestration and mastoid operation cavities; the irrigation of burns, abscess cavities and other wounds where infection is present has proved similarly effective. Satisfactory results have also been achieved in cases of infection following plastic surgery.

REFERENCES:

"Treatment of Chronic Otorrhœa and Chloromycetin" *Brit. Med. J.*, 2:939, 1951

"Local Use of Chloramphenicol in Wound Infections", *Lancet*, 1:541, 1952

CHLOROMYCETIN TOPICAL
(*chloramphenicol B.P. 10 per cent in propylene glycol*)
is supplied in 5 c.c. vials,
with dropper

Parke, Davis
& COMPANY, LIMITED *Inc. U.S.A.*

HOUNSLOW, MIDDLESEX
Telephone: Hounslow 2361

380

In many respects THE SAFEST among the potent hypotensives

VERILOID

a unique alkaloidal extract of Veratrum viride

- lowers blood pressure by vasorelaxation independent of vagomotor effect
- no ganglionic or adrenergic blocking
- no danger of postural hypotension
- cardiac output is not reduced
- no compromise of renal function
- no decrease of cerebral blood flow
- tolerance or sensitivity rarely develops
- can be given over long periods without loss of efficacy

now in a new and highly advantageous dosage form . . .

RAUWILOID + VERILOID

WHAT RAUWILOID IS

Rauwiloid represents the standardized alkaloids of Rauwolfia serpentina, each batch being tested in dogs for hypotensive, bradycardic and sedative effects.

The addition of Rauwiloid (1 mg.) to Veriloid (3 mg.) in one tablet presents unique advantages. Rauwiloid, a mild hypotensive producing virtually no side-effects, leads to desirable moderate bradycardia, a feeling of calm tranquillity, and rapid remission of symptoms. It apparently potentiates the powerful hypotensive action of Veriloid, thus making it possible to obtain marked reduction of blood pressure from lower doses of Veriloid with less likelihood of side effects.

The initial dose is one tablet taken three times daily at intervals of not less than four hours, preferably after meals. Once the effect of Rauwiloid is established the dosage should be increased according to the individual's response. Whereas some patients may require as many as two tablets four times a day, the average requirement of Rauwiloid + Veriloid is one tablet four times daily.

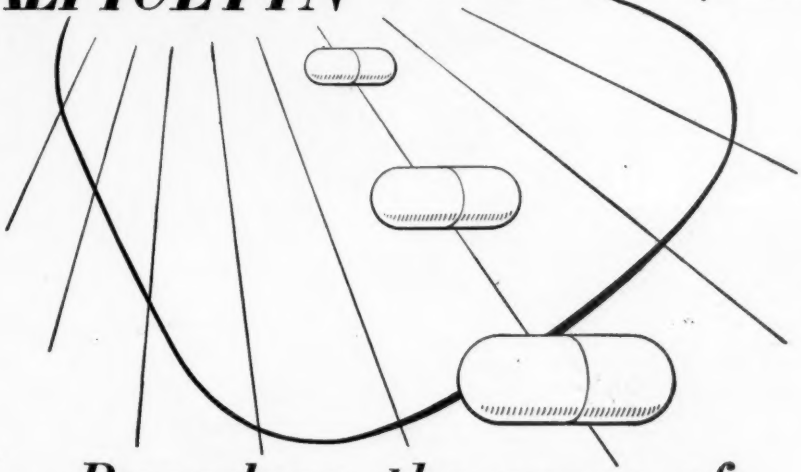
"RAUWILOID" and "VERILOID" are Registered Trade Marks

Registered Users:

RIKER LABORATORIES LIMITED

29 KIRKEWHITE STREET, NOTTINGHAM

ALFICETYN *British-made Chloramphenicol*



Broadens the scope of antibiotic therapy

ALFICETYN brand of Chloramphenicol materially extends the scope of antibiotic therapy. The wide range of antibacterial action of ALFICETYN and, hence, its breadth of clinical application led to its ready acceptance and extensive employment.

Today, ALFICETYN stands in the forefront of modern therapeutic aids and it is used by an ever-increasing number of physicians and surgeons.

ALFICETYN CAPSULES, for oral administration, are available in bottles of 12 capsules each containing 0.25 gramme Chloramphenicol B.P.

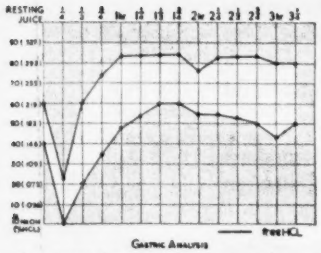
ALFICETYN BRAND

CAPSULES OF CHLORAMPHENICOL B.P.

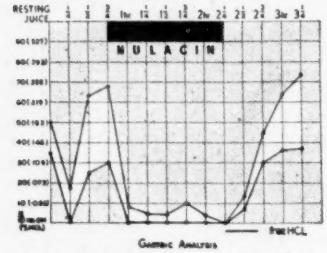
ALLEN & HANBURYS LTD LONDON E 2

TELEPHONE BISHOPSGATE 3201 (20 LINES) TELEGRAMS "GREENBURYS BETH LONDON"

Offers all the advantages of drip therapy without the inconveniences



Superimposed gruel fractional test-meal curves of five cases of duodenal ulcer.



Same patients as in Fig. 1, two days later, showing the striking neutralizing effect of sucking Nulacin tablets (3 an hour). Note the return of acidity when Nulacin is discontinued.

A maintained continuous state of gastric anacidity has heretofore been impossible without hospitalization and discomfort to the patient.

Now, clinical work in progress confirms NULACIN to provide "the nearest approach to the continuous intragastric drip for the ambulatory patient."★ A NULACIN tablet placed in the mouth and allowed to dissolve slowly, releases its contained medicaments at a rate that gives continuous neutralization of the acid gastric juice. NULACIN accomplishes this simply, effectively and without attendant disadvantages.

INDICATIONS: NULACIN tablets are indicated whenever acid neutralization of the gastric contents is required: in active and quiescent peptic ulcer, gastritis, gastric hyperacidity.

Dosage: Beginning half-an-hour after food a NULACIN tablet should be placed in the mouth and allowed to dissolve slowly.

During the stage of ulcer activity up to three tablets an hour may be required. During quiescent periods, for prophylaxis in peptic ulcer and for the relief of discomfort due to gastric hyperacidity, the dose of NULACIN is one or two tablets between meals.

NULACIN tablets are not advertised to the public and have no B.P. equivalent. May be prescribed on E.C.10. The dispensing unit of 25 tablets is free of purchase tax. (Price to pharmacists . . . 2/-). Also available in tubes of 12.

NULACIN tablets are prepared from whole milk combined with dextrins and maltose, and incorporate:

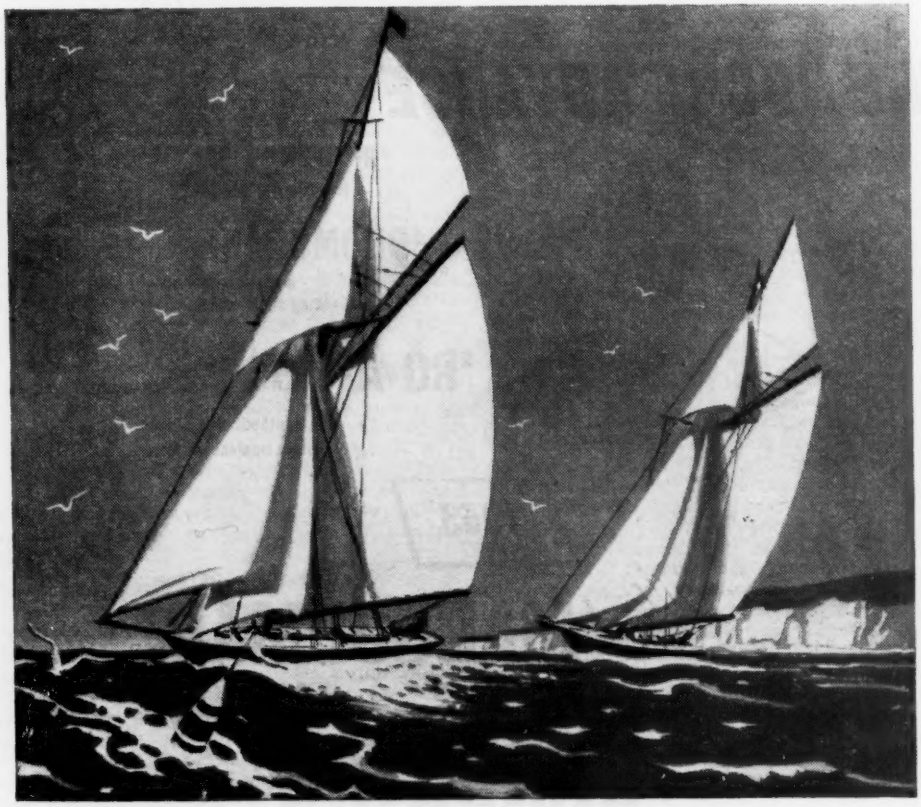
Magnesium Trisilicate 3.5 grs.
Magnesium Oxide 2.0 grs.
Calcium Carbonate 2.0 grs.
Magnesium Carbonate 0.5 grs.
Ol. Menth. Pip. q. s.

★ *J. Lab. Clin. Med.* 42:955 (1953)

BIBLIOGRAPHY: Brit. Med. J., 183-184, 23*rd January*, 1954
Brit. Med. J., 180-182, 26*th July*, 1952
Med. Press, 195-199, 27*th February*, 1952

NULACIN

HORLICKS LIMITED, ***Pharmaceutical Division,*** **SLOUGH, BUCKS.**



Free to breathe again

Most cases of asthma respond excellently to 'Neo-Epinine'. More effective than adrenaline or ephedrine as a bronchodilator, it has the further advantage that it is relatively free from side-effects. Rapid relief follows the use of 'Neo-Epinine' No. 1 Spray Solution, a plain 1 per cent aqueous preparation. 'Neo-Epinine' sublingual products, 20 mgm., act within 5-10 minutes. Stubborn cases may need 'Neo-Epinine' No. 2 Compound Spray Solution, which contains 1 per cent of the drug with 2 per cent of papaverine and 0·2 per cent of atropine methonitrate.

'NEO-EPININE'
BRAND
ISOPRENALINE SULPHATE

BURROUGHS WELLCOME & CO. *(The Wellcome Foundation Ltd.)* LONDON

THE ROCHE ADVANCE 1952

'RIMIFON'
the original isoniazid

'DROMORAN'
a new analgesic
longer acting than morphine

'RO-A-VIT'
synthetic vitamin A
with no unpleasant taste

1953

'MARCOUMAR'
a long-acting oral anticoagulant

'KONAKION'
VITAMIN K_1
the specific antidote to 'Marcoumar' and similar compounds

'RONICOL'
a new vasodilator with fewer side-effects

1954

The Roche laboratories will continue to lead the way in chemical, pharmaceutical and clinical research throughout the world.

ROCHE PRODUCTS LIMITED · 15 MANCHESTER SQUARE · LONDON · W.1 · Welbeck 5566

THE PATHOGENESIS OF RHEUMATIC FEVER *

D. A. LONG
M.D. Lond.

From the National Institute for Medical Research, Mill Hill, London

THE Milroy lectures were founded to encourage the study of the influence of infection, nutrition, and environment upon disease in man. Dr. Milroy suggested that experimental work in animals be included, with the safeguard that all such evidence must be "weighed and sifted by medical men in order to determine whether the natural laws which regulate or affect the development and progress of the two classes of morbid phenomenon are analogous, or otherwise." A strong analogy is one in which, in both species, all features to be studied exist and bear comparable relations to each other. It is logical, therefore, for the laboratory worker to begin by reviewing the natural history of disease in man in order to select features for study, and then to choose an experimental animal in which these features exist or can be induced. Conversely, it is illogical to start with an experimental animal chosen at random, in the hope that its responses will be analogous to those in man; and yet this is the method which has almost always been adopted in experimental studies intended to elucidate rheumatic fever.

EVIDENCE FROM MAN

The Hæmolytic Streptococcus

The intimate relationship of the hæmolytic streptococcus with rheumatic fever (Coburn 1931, Swift 1949) provides the most important clue to the nature of this disease. But opinion is divided between those who consider group-A hæmolytic streptococci essential to the disease, and others—"the majority," according to Hench and his colleagues (1938)—who "consider the prodromal respiratory infections to be non-specific provocatives" to be compared with trauma, cold, fatigue, sunburn, or malaria (Waksman 1949), which it is suggested, can initiate the disease in the absence of streptococcal infection. However, when considering reports of rheumatic fever in the absence of streptococcal infection, it is important to remember the inaccuracy of bacteriological diagnosis; for, even in acute scarlet fever, attempts to isolate streptococci fail in 10% of cases (Wilson and Miles 1946). Thanks to the outstanding work of Coburn (1931) and Swift (1949), the bacteriological and immunological evidence that hæmolytic streptococci cause rheumatic fever is at least as good as that suggesting that hæmolytic streptococci cause scarlet fever.

Serological responses in patients with rheumatic fever are indistinguishable from those associated with chronic streptococcal infection; nor has an increased incidence of rheumatic fever been associated with any particular type or strain of group-A streptococcus (Swift 1949, Rantz, Boisvert, and Spink 1945). It is therefore probable that, provided certain criteria are fulfilled, some general property of group-A streptococci initiates the disease in susceptible persons. The infection must persist for approximately three weeks; if this stage is interrupted by chemotherapy or antibiotic treatment, the disease does not occur; but, once the syndrome has developed, such therapy is ineffective (Rantz, Spink, Boisvert, and Coggeshall 1945). Waksman (1949) argues that "the fact that sulphonamide compounds and penicillin are ineffectual when administered after the onset of the attack, is additional proof that the initiating infection is not the direct 'cause' of the disease but acts only by starting in motion some more complex mechanism." This argument is not valid. The ineffectiveness of such drugs in the treatment of non-pyogenic complications of scarlet fever is not proof that such complications are due to causes other than streptococcal infection, nor does the failure of streptomycin to eliminate tuberculin-sensitivity exclude the tubercle bacillus from being the ætiological agent of tuberculosis. It may be that if a hæmolytic streptococcal infection is controlled before maximal allergic hypersensitivity has been achieved, the rheumatic syndrome will not occur, but that once maximal sensitivity is attained, treatment is without effect.

The idea that hæmolytic streptococci are "non-specific provocatives" may originate from the fact that any severe strain tends to precipitate a flare-up in patients with the established disease. I am not thinking in terms of "stress and the adaptation syndrome," but suggest merely that increased demand might produce the flare-up by exaggerating any streptococcus-induced nutritional or metabolic deficiency. But if hæmolytic streptococci are seriously to be considered as non-specific provocatives, how are we to explain the dramatic parallel decrease, since 1940, in deaths from rheumatic fever and from hæmolytic streptococcal infection? (Wheatley 1949.) Are we to attribute the latter to the advent of antibiotics and chemotherapy, ignore the prophylactic value of these drugs in rheumatic fever, and regard the decrease in deaths from rheumatic carditis as fortuitous?

It might be argued that "stressor agents" sensitive to penicillin and sulphonamide are of such significance that "stressor agents" which are insensitive can be virtually ignored. But has "stress" anything to do with initiating the disease? If rheumatic fever is due to "streptococcal stress," the incidence should be proportional to the severity of the initial attack of streptococcal tonsillitis, and the syndrome should develop when "stress" is maximal rather than three weeks later. As neither of these things happens, an alternative explanation must be found.

Bacterial Allergy

From what has been said, it is possible that sensitivity to streptococcal allergens may start the disease. Clearly, it is the host, not the streptococcus, that decides the issue; for only a small proportion (possibly 5%) of patients with hæmolytic streptococcal infection develop rheumatic fever. They show a persistent low-grade localised streptococcal infection in spite of remarkably high antitoxin titres: predisposition of one attack of rheumatic fever to another; a decreasing time-interval between infection and recurrence; dermal hypersensitivity to streptococcal allergens (Coburn 1931, Swift et al. 1928); and a delayed tuberculin type of reactivity following intravenous injection of streptococcal allergens (Swift et al. 1928). All these suggest that rheumatic fever is initiated by hypersensitivity, of the tuberculin type, to streptococcal allergens. In this connection, the analogy with tuberculosis is strengthened by the observation that streptococcal infections in very young children tend to be diffuse and clinically undiagnosable; repeated infection leads to localisation, this occurring in the age-group with the highest incidence of rheumatic fever (Powers and Boisvert 1944, Paul and Salinger 1931). These are ideal conditions for inducing maximal sensitivity of the tuberculin type. In keeping with this hypothesis, the histological changes, unlike those usually associated with a pyogenic coccus, are characterised by absence of bacteria, extensive œdema, increased capillary permeability, changes in collagen, accumulation of mononuclear cells, and absence of polymorphonuclear cells. In addition, Aschoff's nodes have been described in patients with tuberculosis (see Waksman 1949).

In spite of sensitivity of the tuberculin type to streptococcal allergens (Swift et al. 1928), some authorities have

* An abridged form of the Milroy lectures for 1954, delivered at the Royal College of Physicians on Feb. 9 and 11.

TABLE I—COMPARISON OF ANAPHYLAXIS AND BACTERIAL ALLERGY

Anaphylaxis	Bacterial allergy (tuberculin type)
Laboratory phenomenon	Natural phenomenon
Sensitivity induced by single injection of allergen	Sensitivity induced by chronic low-grade infection
Response immediate	Response delayed
Circulating antibody	Fixed antibody
Passively transferred with serum	Passively transferred with cells
Histamine plays major rôle (anti-histamines partly effective)	Histamine plays minor rôle (anti-histamines ineffective)
Cortisone-resistant	Cortisone-sensitive
Characteristic lesion: spasm of smooth muscle	Characteristic lesion: inflammatory-necrotising response

postulated further allergens of different complex types. The subject has been reviewed by Fischel (1949). There is disagreement as to whether the allergens are streptococcal or non-streptococcal in origin, and even disagreement as to whether the response to such hypothetical allergens is of the tuberculin or of the anaphylactic type. My own views are quite clear in this matter. I believe that hæmolytic streptococci are essential to rheumatic fever and that when the criteria outlined are fulfilled the disease will occur in susceptible persons, owing, at least in part, to sensitivity to streptococcal allergens. I accept the evidence that sensitivity of the tuberculin type to streptococcal allergens exists in these patients, and I see no reason for, or advantage in, postulating another allergen. The facts in table I provide strong support for this view.

Bacterial allergy of the tuberculin type is a naturally occurring phenomenon typically associated with low-grade, persistent, comparatively avirulent foci of streptococcal (Angevine 1939, 1941) or of tuberculous infection; it takes three weeks from the initial infection to develop fully, at which time a delayed inflammatory-necrotising response occurs on injection of allergens. Such sensitivity is independent of circulating antibody, but can be passively transferred with cells. Histamine has a minor rôle in its ætiology. Anti-histamines do not, although cortisone does, diminish this type of allergic response.

In direct contrast, the anaphylactic type of sensitivity is a laboratory phenomenon, artificially induced by a single injection of a protein; it takes ten days to develop, after which time a second injection produces an immediate dramatic response characterised by spasm of smooth muscle. Such sensitivity, associated with circulating antibody, and passively transferable with serum, provides an interesting research tool, although it bears no known relation to naturally occurring disease in man. Histamine has a major rôle in causing it, and anti-histamines provide some protection. Cortisone is without effect. In spite of this evidence, the anaphylactic hypothesis is widely accepted, particularly by morbid anatomists. In fact, it is probably true to say that in one form or another it is held by the majority of experts on both sides of the Atlantic. But the anaphylactic hypothesis does not appeal to me as an immunologist, and I imagine that if I were unwise enough to attempt to persuade physicians that rheumatic fever (or even sensitivity to streptococcal allergens) is passively transferable with serum, and responds to anti-histamines but not to cortisone, they would equally readily reject the idea. On the other hand, arguments against the hypothesis that bacterial allergy of the tuberculin type initiates the disease are not formidable. It is true that hypersensitivity may develop in the post-streptococcal state without symptoms of rheumatic fever. But this is less of a distinction than it at first appears to be, for rheumatic carditis often occurs without a history of rheumatic fever, the post-streptococcal state merging imperceptibly into the rheumatic syndrome (Rantz, Spink, and Boisvert 1946). However, though streptococcal allergy may occur without rheumatic fever, there is no satisfactory evidence that rheumatic fever may occur without streptococcal allergy. It is likely, nevertheless, that other factors determine the clinical intensity of the disease.

Streptococcal Toxæmia

Group-A streptococci, if they are essential to rheumatic fever, must provide more than a bacterial allergen: for the tubercle bacillus can do as much, and yet, though there are reports of tubercle bacilli initiating both rheumatic fever and the analogous disease rheumatoid arthritis, this probably happens but rarely. To me this is a real objection to the hypothesis of bacterial allergy. There must be something provided by group-A streptococci in general, in addition to an allergen, essential to the pathogenesis of rheumatic fever. In an attempt to meet this criticism, Grey and I (1954) have suggested that mesenchymal cells damaged by streptococcal toxin are more sensitive than undamaged cells to bacterial allergens, and that hæmolytic streptococci provide both allergens and comparatively innocuous toxins which act synergistically upon the same cells. In support of this idea we have shown that group-A streptococci produce a rather innocuous heat-labile exotoxin that increases sensitivity to tuberculin in sensitised guineapigs, and, moreover, impairs desensitisation by cortisone, thus bringing the effective desensitising dose well into the pharmacological range (Grey and Long 1954). Exotoxins derived from other bacteria do not have this property. This does not, of course, prove that similar conditions apply in man, but it provides a working hypothesis consistent with the evidence in man, particularly with the prophylactic but not curative value of penicillin.

Factors that Influence Susceptibility

The many factors that influence susceptibility to the disease have been well reviewed by Waksman (1949), who has provided as he intended "a general review tracing the main current of thought concerning the ætiology of the disease"—a work that I have freely criticised and quoted because I know of no other so well documented that states clearly current views of the ætiology of rheumatic fever. In contrast to this mass of data, I shall consider only the two aspects I believe to be most profitable—the influence of nutrition and of hormones upon the disease.

NUTRITION

Any increased demand on the body, whether infectious or non-infectious in origin, will exaggerate an existing dietary deficiency or may precipitate a new one. Such deficiencies are likely to arise first in substances that the body cannot store—i.e., in water-soluble vitamins and in essential amino-acids.

Protein Deficiency

A deficiency of a single essential amino-acid prevents protein anabolism, tissue repair, and—of great importance—enzyme synthesis. Diminished enzyme synthesis impairs digestion, and thus, by setting up a vicious circle, tends to increase the deficiency. It is seldom appreciated that the turnover of amino-acids is greater in the actively secreting intestinal mucosa than in any other part of the body, including even liver and kidney (see Samson Wright 1953).

Kwashiorkor is an extreme example of a disease attributable to protein deficiency in which lack of digestive enzymes leads to undigested food being passed as fæces. Liver damage and, even more intriguing, hyperglobulinæmia are associated phenomena (Brock and Autret 1950, Davies 1952). There is

also apparently an analogous protein-deficiency disease characterised by multiple small areas of necrosis in heart muscle (Davies 1952).

Of all the essential amino-acids, deficiency in methionine has the widest metabolic repercussions because of its many functions. Such a deficiency might conceivably account for the many metabolic and nutritional disorders described in rheumatic fever. There is some evidence, collected in support of quite different hypotheses, which is nevertheless consistent with the view that lack of biologically valuable protein predisposes to rheumatic fever. First, rheumatic fever is less common in protein-eating farming States than in cotton and tobacco States of America (Peete 1944). Second, powdered egg-yolk prevented recurrence of rheumatic fever in under-privileged children in spite of recurrent attacks of hæmolytic streptococcal infection (Coburn and Moore 1943). In addition, glycine metabolism is disturbed in patients with the analogous disease, rheumatoid arthritis (Lemon et al. 1953). In spite of the flaws in this type of argument, I shall add " protein deficiency " to " bacterial allergy of the tuberculin type " as a subject for study.

Ascorbic-acid Metabolism

Rinehart and his colleagues (1934a and b, 1935, 1936) suggested that deficiency of ascorbic acid, together with hæmolytic streptococcal infection, caused rheumatic fever, but he withdrew his hypothesis when it was found that the level of ascorbic acid in the blood fell with any fever, that ascorbic acid was clinically ineffective in the treatment of rheumatic fever, and that blood-ascorbic-acid levels remained low in this disease in spite of large doses of ascorbic acid (Rinehart 1943). It is curious that, in the light of these criticisms, the hypothesis was never replaced by a new one, and that this stimulating approach was not continued. Particularly as Harris and his colleagues (Abbasy et al. 1936, 1937) confirmed that very large doses of ascorbic acid were needed to saturate, and maintain saturation in, patients with rheumatic fever, with rheumatoid arthritis, and with active tuberculosis—diseases, incidentally, in which we believe bacterial allergy plays a significant rôle. It is unlikely that ascorbic acid in such quantities is used profitably, and likely that it is being wasted ; for even a patient with scurvy would not need such large amounts of vitamin C. It is not excreted in the urine. If ascorbic acid is oxidised to dehydro-ascorbic acid, the change is reversible, with resulting economy : if oxidation proceeds further than this—to diketogulonic acid, for example—the change is not reversible, with resulting waste. It may be that patients with rheumatic fever or with active tuberculosis tend to oxidise ascorbic acid more readily than other patients, and that it will be possible and profitable to link this hypothesis with bacterial allergy and protein deficiency, in particular with deficiency of sulphur-containing amino-acids.

The Vitamin-B Complex

These vitamins are water-soluble and cannot be stored. As co-factors or co-enzymes they are essential for phosphorylation. In disease, lack of co-enzymes, due possibly to a deficiency of phosphate donors, could upset normal pathways of metabolism (Bergel 1952) : in rheumatoid arthritis, for example, an increased level of pyruvate (Lövgren 1952) indicates an abnormality of energy transfer, affecting in particular the tricarboxylic acid cycle with its ramifications into fat and protein metabolism. In addition, vitamins of the B complex and essential sulphur-containing amino-acids are needed for the hepatic control of steroid hormones (Biskind 1946). The vitamin-B complex has therefore been included in the list of factors to be studied, and detailed information about particular members of the group will be considered as the need arises.

ENDOCRINE FACTORS

The Thyroid

Sir Archibald Garrod thought the association of rheumatic fever and Graves's disease " more than a coincidence," an opinion still held by Coburn (1945) and Connor (1946) ; although a decreased basal metabolic rate occurs in rheumatic fever (Brown and Wasson 1943). Sir Walter Langdon-Brown also thought the relation of the thyroid gland to rheumatic fever important (1928). In spite of an apparent association of rheumatic fever with both hyperthyroidism and hypothyroidism, a clinical impression arising in the minds of the great medical thinkers of their time justifies the inclusion of the thyroid gland in the list, for only the study of man can supply facts about the pathogenesis of rheumatic fever.

The Adrenal Cortex

The discovery that corticotrophin and cortisone relieve the symptoms of rheumatic fever has led many to postulate that adrenocortical deficiency might be a factor in initiating rheumatic fever. There is little to support this contention. It is probably not an over-statement to say that cortisone poisoning is associated with symptomatic relief and that the therapeutic action of cortisone is pharmacological, not physiological. In addition, there is no evidence that hypo-adrenalism predisposes to rheumatic fever. Addison's disease is not associated with the syndrome. Until recently, hypo-adrenalism was treated with water-soluble adrenal extracts rich in " salt " hormones but lacking in " sugar " hormones of the adrenal cortex, and rheumatic fever did not occur as a complication of such treatment. There is, therefore, evidence that " salt " hormones in the absence of " sugar " hormones do not precipitate the rheumatic syndrome. It is unlikely that a deficiency of cortisone, with or without a deficiency of " salt " hormones, is a major factor in initiating the disease.

There is evidence that " stress " (a collective term used at present to describe a change in circumstance or environment) increases adrenocortical activity in the rat—a phenomenon associated with involution of lymphatic tissue, ulceration of the gut, and, among other side-effects, hypofunction of the other endocrine glands (Selye 1937). There is thus some slight basis for attempts to explain these particular phenomena in this particular species in terms of increased adrenocortical activity and virtually to ignore the other endocrine glands. But apparently " stress " does not vigorously stimulate adrenocortical activity in man. Status asthmaticus, or even death itself, fails to provide the stimulus directly induced by the injection of a comparatively small dose of corticotrophin, or indirectly by insulin injection (Kersley et al. 1951). Clearly, the pharmacology of cortisone, and, in particular species susceptibility to the drug, must be added to the list of subjects for study.

Insulin

Rheumatic fever is seldom associated with diabetes mellitus (Barach 1926, Joslin 1937). The development of diabetes in patients with rheumatic fever reduced the incidence of heart damage (Joslin 1937). Conversely, patients with rheumatic fever show " functional hyperinsulinism " (Steincrohn 1938, Abrahamson 1944). In patients with the analogous disease, rheumatoid arthritis (Kersley et al. 1951), the compensatory phase that follows insulin hypoglycæmia is associated with symptomatic relief. This see-saw idea is supported by the fact that the islets of Langerhans obtain their nerve-supply from the parasympathetic, whereas the other endocrine glands obtain theirs from the sympathetic part of the autonomic nervous system, and that, in laboratory animals at least, injection of thyroxine, cortisone, or growth hormone all cause hypertrophy of the islets of Langerhans. Insulin and growth hormone must be added to the list, if only

because of their effects on carbohydrate metabolism and upon the adrenal cortex.

The Collagen Diseases

It is logical to group diseases together because they have factors in common; such action precedes the formulation of a hypothesis and the experimental approach. Of course, the full-time critic draws attention to the differences and ignores the similarities, but by doing so he merely emphasises his inability to appreciate the type of argument employed. The factors the collagen diseases have in common are: lesions in the extracellular protein components of mesenchyme; hyperglobulinæmia; a tendency for heart, blood-vessels, joints, and serous membranes to be involved; and a tendency towards enlargement of lymph-glands and spleen. Hypersensitivity has been linked with each disease, with varying success. As a group they tend to respond to cortisone, although the more chronic the disease the less striking is the clinical response. Massive doses may be required, suggesting that some pharmacological action of cortisone is responsible for symptomatic relief.

Ascorbic acid is essential for maturation of collagen, thus providing a further reason for studying ascorbic-acid metabolism. Protein metabolism is obviously involved in the pathogenesis of these diseases. Globulin can be synthesised from vegetable protein, and, in keeping with this observation, hyperglobulinæmia can occur in diseases caused by deficiency of animal protein: it also occurs with liver damage, with continued antigenic stimuli, and with parasitic infections associated with hypersensitivity. In contrast to plasma proteins in general (Miller et al. 1949, 1951, MacFarlane 1952) globulin can be produced extra-hepatically, even when liver damage and protein deficiency have impaired the synthesis of albumin. The rate of globulin turnover is increased in patients with cirrhotic livers (see *Nutrition Review* 1953).

It may be that collagen diseases affect not only fibrous connective tissue but also all the derivatives of primitive mesenchyme—connective tissue, reticulum, cartilage, bone, and muscle—that they have in common a primitive mesenchymal defence mechanism associated with increased synthesis of globulin, including antibody globulin (Aegerter and Long 1949). Alternatively, although, as Archer (1951) points out, hyperglobulinæmia is not necessarily an indication of liver damage, it is possible that the hyperglobulinæmia of these diseases is a compensatory phenomenon associated with impaired liver function, due to a deficiency of essential amino-acids. Whipple (1942) and his colleagues showed that, although the body cannot store protein, there are considerable reserves in tissues which can be withdrawn without impairing vital function. Plasma proteins are readily replaced from tissues; conversely, plasma proteins injected intravenously can supply all the protein requirements of the body, suggesting that plasma protein can be readily incorporated into tissues. Recently Neuberger and his colleagues (Harkness et al. 1954) have shown that protein electrophoretically indistinguishable from plasma protein is present, probably extracellularly, in large amounts in close association with the collagenous protein of connective tissues. This important observation not only provides an explanation of the source of Whipple's protein reserves but also supports the suggestion that in the collagen diseases connective tissue provides protein and globulin for the general metabolic pool.

In this connection, more evidence on liver function in rheumatic fever in particular, and in the collagen diseases in general, would be valuable. There is evidence of hepatic damage in rheumatic fever (see Waksman 1949) and in rheumatoid arthritis (Baggenstoss and Rosenberg 1943, Darby 1954) but much more information is needed about liver function in the collagen diseases, particularly in relation to protein metabolism.

Of all the clues that the collagen diseases can provide, hyperglobulinæmia interests me most. As the basis of allergic and of immune responses, the biological activity of gamma-globulin needs to be considered in relation to the many factors already discussed.

Conclusions

The conclusions reached on the evidence from man are that hæmolytic streptococci of Lancefield's group A initiate rheumatic fever by inducing hypersensitivity, of the tuberculin type, to streptococcal allergens, but that other factors—chiefly dietary and hormonal—influence susceptibility to the disease. The hypothesis advanced for experimental study is that susceptibility to rheumatic fever and sensitivity to bacterial allergens amount to the same thing. Thus by studying in animals factors that influence sensitivity, of the tuberculin type, to bacterial allergens, it might be possible to learn something of factors that influence susceptibility to rheumatic fever.

EVIDENCE FROM ANIMALS

In view of the many factors to be studied, large numbers of simple experiments were undertaken to investigate concurrently different facets of the problem. This method, by providing many new and apparently unrelated facts, causes initial confusion; but, as independent approaches meet in common metabolic pathways, order gradually appears. To describe preliminary experiments and hypotheses would be both confusing and unprofitable. For instance, much of the early work on the thyroid (Long and Miles 1950, Long et al. 1951b) and upon cortisone-cabbage-ascorbic relationships (Long et al. 1951a and c) has been superseded, and the actions of both are now interpreted in terms of a single metabolic system (Long 1954a).

But, before considering evidence from animals relevant to the pathogenesis of rheumatic fever, it is wise to recall Dr. Milroy's instructions that: "All such evidence must be weighed and sifted by medical men in order to determine whether the natural laws which regulate or affect the development and progress of the two classes of morbid phenomenon are analogous, or otherwise."

No experimental worker can provide a single fact about human disease; logic, well-chosen analogies, and impeccable experiments yielding statistically significant results may diminish the odds on the gamble sufficiently to provide the clinician with a reasonable guess as to the happenings in man. With luck, an animal-inspired hypothesis may be confirmed in man by the clinician, and so a fact about human disease is obtained.

It is foolish, then, to try to squeeze the whole of human pathology into the pint pot of notions based on the random study of a single creature. Such action brings discredit on experimental pathology as a whole. This error can be avoided by continually checking the analogy between animal and man, and by making certain that the limitations of argument by analogy are fully understood (see Jevons 1931). If analogies are good, hypotheses have a reasonable chance of providing valid evidence in man.

No objection can be taken to honest speculation, or to imaginative and provocative thought; but every experimental worker has a responsibility to consider the logic on which argument from animal to man is based, to provide the best evidence that can be obtained by the application of such knowledge, and to state fairly what weight may reasonably be attached to his observations.

In my view, it is an additional advantage to explain the facts with a simple hypothesis which can be confirmed or destroyed by direct experiment. A good hypothesis has a productive short life.

THE CHOICE OF EXPERIMENTAL ANIMAL

Only man, cow, monkey, and guineapig are known to be readily sensitised to bacterial allergens of the tuberculin

TABLE II—COMPARISON OF SPECIES

Species	Tuberculin-sensitivity	Ascorbic-acid synthesis	Pharmacological response to cortisone
Man Monkey Guineapig	Readily induced	Ascorbic acid not synthesised	Resistant (antitoxin synthesis not depressed)
Rat Mouse Rabbit Ferret	Not readily induced	Ascorbic acid synthesised	Sensitive (antitoxin synthesis markedly depressed) *

* Antitoxin effect not known for ferret.

type. The reason for this is unknown. Man, monkey, and guineapig are unable to synthesise ascorbic acid, and are therefore readily made deficient in this substance; but this does not apply to the cow. It follows that in these respects only the guineapig and monkey are analogous to man.

In a series of cortisone toxicity experiments (50 mg. per kg. body-weight daily for 10 days) the guineapig and monkey gained weight, but the rat, mouse, rabbit, and ferret lost weight (fig. 1). Of the cortisone-sensitive creatures, the ferret maintained the best condition. This was attributed to the high content of biologically valuable protein in its diet. In support of this hypothesis, skimmed milk significantly decreased the loss of weight induced by cortisone in rabbits, suggesting a cortisone-protein antagonism—an idea that constantly recurs. These findings have been briefly stated elsewhere (Lloyd and Long 1954), but full details await evidence from histology, electrophoresis, biochemistry, and serology. Nevertheless, it is certain that this species difference in susceptibility to cortisone applies not only to body-weight but also to gamma-globulin and antitoxin synthesis (Lloyd and Long, unpublished). The increasing strength of the analogy (table II) is not, I think, fortuitous, but supports the hypothesis that sensitivity to bacterial allergens, inability to synthesise ascorbic acid, gamma-globulin metabolism, antitoxin formation, and sensitivity to cortisone are interrelated. The guineapig was used in all experiments; the monkey was used to confirm important data gained in the guineapig; the cortisone-sensitive species, such as the rat or rabbit, were used when it was felt that the intentional use of a poor analogy might lead to an instructive caricature effect.

METHODS

Methods of sensitising guineapigs to streptococcal allergens proved variable in my hands, and sensitivity to tuberculin was preferred. A rapid method, using guineapigs sensitised with B.C.G. vaccine, giving results capable of statistical analysis, was devised (fig. 2) (Long and Miles 1950). In brief, if the mean diameters of lesions, resulting from the intradermal injection of tuberculin into sensitive guineapigs are plotted against the logarithm dose of tuberculin, a straight line results. Agents that depress sensitivity cause the line to move to the right; conversely, agents that increase sensitivity cause the line to move to the left. The statistician provides valuable evidence as to the size and variability of the effect.

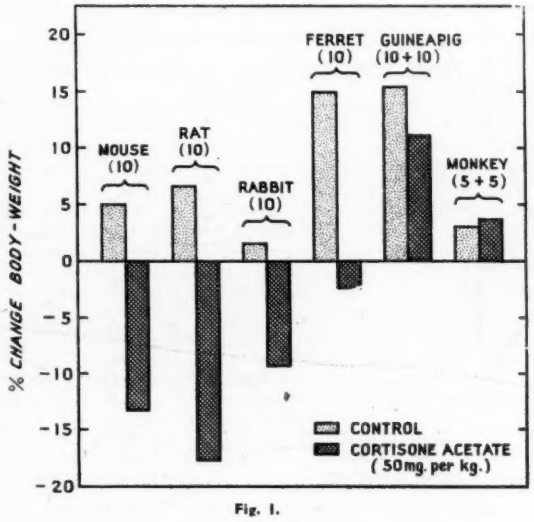


Fig. 1.

Cortisone

In guineapigs a single injection of cortisone acetate (5 mg. per kg. body-weight) depresses sensitivity to tuberculin. This effect is seen almost immediately and is maximal at six hours. It is not enhanced by increasing the dose, or by giving cortisone daily throughout the sensitising process.

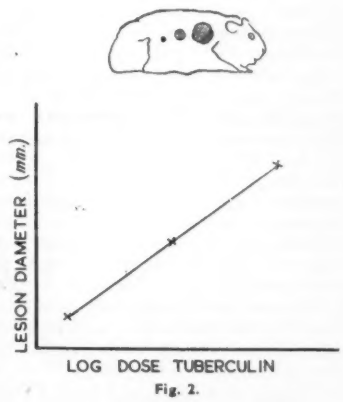


Fig. 2.

Since cortisone and hydrocortisone, alone among the steroids, are therapeutically active (Thorn et al. 1953), the analogy between the tuberculin-sensitive guineapig and rheumatic man must be checked again. Any alteration of the functional units of cortisone and hydrocortisone other than acetylation of the 21-hydroxyl group leads in the guineapig to loss of desensitising potency (Long and Spensley 1954). This specificity provides a clue to the mechanism of desensitisation, for these steroids alone significantly increase nitrogen excretion and profoundly affect carbohydrate metabolism (Thorn et al. 1953). This brings us back to the idea of a cortisone-protein antagonism, and suggests (what is virtually undisputed) that the effect of cortisone on carbohydrate metabolism is secondary to its effect on protein. But the question is—which effect influences therapeutic action and which influences desensitisation?

THE "ANTIPHLOGISTIC" HYPOTHESIS

It would be needlessly extravagant to study the "anti-allergic" activity of cortisone if it were merely part of a non-specific "anti-inflammatory" action.

It has been postulated that "sugar" hormones of the adrenal cortex exert an "antiphlogistic action," and "salt" hormones and growth hormone exert a "prophlogistic action" (Selye 1954). This is a bad hypothesis; a good hypothesis provides a simple explanation of the facts, capable of proof or disproof. No chemist since Lavoisier would attempt to extract "phlogiston" from inflamed tissues, yet if this hypothesis means anything, such is the logical sequence; and if it means nothing, what purpose does it serve? However, Selye was not the originator of the term; to him it means "anti-inflammatory" (Selye 1954). This interpretation of the hypothesis can therefore be tested.

Cortisone does not influence the size of inflammatory lesions resulting from the injection into the skin of the guineapig of exotoxins derived from *Corynebacterium diphtheriæ*, *Clostridium welchii*, hæmolytic streptococci, or *Staphylococcus pyogenes*; nor does it influence the size or progress of inflammatory lesions resulting from

the intradermal injection into guineapigs of living hæmolytic streptococci, *Staph. pyogenes*, or *Cl. welchii*; nor does it influence the response of the guineapig skin to histamine or to histamine liberators. The ability of cortisone to depress sensitivity to tuberculin in the guineapig cannot therefore be attributed to a non-specific "anti-inflammatory" action. In cortisone-sensitive creatures cortisone can, of course, abolish the local defence mechanism to bacterial invasion; but there is a profound species difference. Thus cortisone does not exert a non-specific "anti-inflammatory" response in the guineapig; neither does the "salt" hormone deoxycortone acetate, even in large doses (45 mg. per kg.), exert a "prophlogistic" effect in the guineapig and increase sensitivity to tuberculin (Long and Spensley 1954).

Growth hormone, far from being "prophlogistic," depresses sensitivity to tuberculin in guineapigs, and moreover acts synergistically with cortisone to depress sensitivity (Cornforth and Long 1953).

The study of man provides little evidence with which to check the strength of this analogy. However, cortisone depresses sensitivity to tuberculin in man and has little, if any, non-specific "anti-inflammatory" effect as judged by skin response (Lovell et al. 1953a). Our analogy, therefore, is valid in this respect. The species difference between cortisone-sensitive and cortisone-resistant animals seems to be more than a matter of degree: it is fundamental and applies to hormones other than cortisone. I suggest, therefore, that the concept of the adaptation syndrome, based as it is on a false analogy, is irrelevant to the pathogenesis of rheumatic fever; and, indeed, both clinical and experimental evidence suggest that it is misleading when applied to the pathology of man.

THE ANTI-ALLERGIC ACTIVITY OF CORTISONE

In theory, cortisone might depress sensitivity to tuberculin by decreasing the amount of fixed antibody available in the tissues. But this is unlikely because continuous administration of cortisone does not desensitise more effectively than a single dose. Nor does cortisone depress the antibody response of the guineapig either to a sensitising dose of an anaphylactogen or to an immunising dose of diphtheria toxoid.

It is unlikely that cortisone interferes with the union of antibody and antigen, for, as already stated, it does not prevent anaphylaxis, and it does not inhibit the neutralisation, by circulating antitoxin, of intradermally injected diphtheria toxin. In addition, cortisone not only fails to produce in guineapigs quantitative changes in diphtheria antitoxin but also is without effect on such qualitative changes as avidity and passively induced protective power. Identical neutralisation curves are obtained with antitoxin from guineapigs which have been treated with cortisone and with antitoxin from those which have not. In fact, no quantitative nor qualitative differences between the two have been detected. I do not dispute that cortisone vigorously depresses antitoxin synthesis in cortisone-sensitive species: in fact, it does so in rabbits fed on the same diet, maintained under the same conditions, and immunised with the same antigen as these guineapigs. The guineapig is analogous to man, for cortisone does not depress antitoxin synthesis in man (Havens et al. 1952). In the guineapigs, the unions of antigen and antibody are not in general influenced by cortisone. It is unlikely therefore that cortisone influences the union of tuberculin allergen and antibody.

There is some positive evidence, however, to support the idea that cortisone protects against the toxic products of the union of tuberculin antibody and allergen. Sphingosine (Fisher et al. 1951) and the polyoxyethylene ethers (Hart et al. 1952) depress sensitivity to a degree comparable with that induced by cortisone. But their action differs from that of cortisone in being independent of any known metabolic pathway. It is suggested that sphingosine and the polyoxyethylene ethers directly, and cortisone indirectly, decrease cell permeability, so that toxic substances liberated by union of allergen and antibody diffuse less readily from the damaged cells. In keeping with this hypothesis, the difference between tuberculin-induced skin lesions in cortisone-treated and non-cortisone-treated guineapigs, is, as far as can be judged by histological means, purely quantitative. This hypothesis explains why cortisone does not protect guineapigs against acute allergic phenomena but does have a desensitising action on slowly induced responses of the tuberculin type. The anti-allergic rather than anti-inflammatory effect of all three agents—cortisone, sphingosine, and the polyoxyethylene ethers—would thus be due to reduction of the greatly increased and widespread cell permeability characteristic of allergic responses.

The "cell permeability" hypothesis, although feebly supported, is probably the best of current attempts to explain adrenocortical action (see Ingle and Baker 1953). It is logical therefore to accept it as a working hypothesis. Experiments carried out on an assumption which is later proved false may nevertheless provide facts, the interpretation of which may call for new hypotheses.

PHARMACOLOGICAL EFFECTS OF CORTISONE

Only cortisone and hydrocortisone are therapeutically active and depress sensitivity to tuberculin in guineapigs (Long and Spensley 1954). They differ from related steroids in increasing nitrogen excretion and in profoundly affecting carbohydrate metabolism. This provides the next clue.

Large doses of cortisone inhibit carcase-protein anabolism (Hoberman 1950), so that in cortisone-sensitive creatures body-weight falls and even in cortisone-resistant ones the mass of thymus and lymphatic tissue decreases. As a result, the amino-acid content of plasma and urine rises (Thorn et al. 1953). However, protein anabolism continues in the liver (Clark 1953) and presumably in the kidney, for even in resistant species these organs undergo hypertrophy (Lloyd and Long, unpublished). In brief,

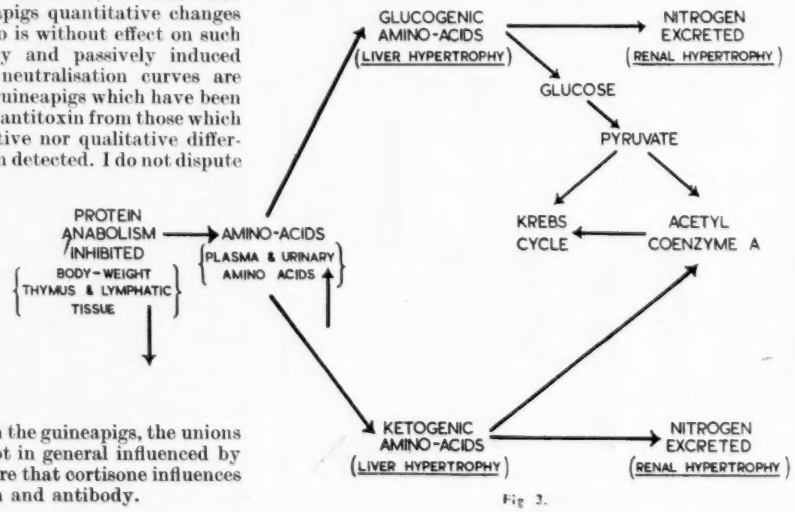


Fig. 2.

cortisone transfers amino-acids, essential and non-essential, from carcase to liver, either to be anabolised to protein (Clark 1953) and presumably enzymes, or to be katabolised, the glucogenic amino-acids to glucose (Cohn et al. 1952) and the ketogenic amino-acids to aceto-acetate. The nitrogen residues are excreted as urea via the kidney and are probably partly responsible for the renal hypertrophy. Carbohydrate, protein, and fat metabolism meet at the metabolic junction of acetyl co-enzyme A (fig. 3)—an enzyme system remarkably involved with, and dependent upon, the factors I have selected for study. Acetyl co-enzyme A depends for activity upon vitamins of the B complex, and upon sulphydryl activation, and therefore indirectly upon the availability in the liver of sulphur-containing amino-acids (Griffiths 1948a and b, Leaf and Neuberger 1947). It follows that the activity of this enzyme system is probably linked with the metabolism of both vitamin B_{12} and ascorbic acid. Cortisone might be expected to affect it in two main ways: (1) by providing amino-acids to be metabolised, and (2) by providing essential amino-acids, particularly sulphur-containing amino-acids needed for synthesis and activation of the enzyme. I am speculating freely so as to show the sense, or lack of it, on which the next experiments are based.

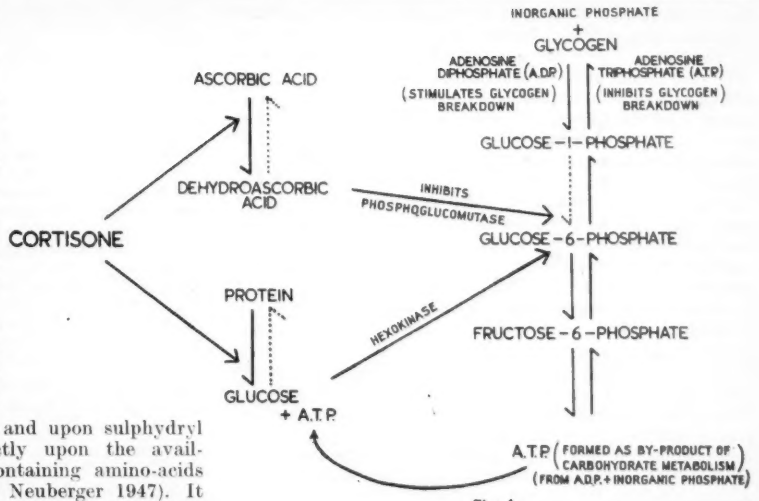


Fig. 4.

In view of the observations of Neuberger and his colleagues (Harkness et al. 1954) to which I have already referred, the connective tissue of skin and carcase might well be the source of protein mobilised by cortisone—the anti-anabolic action in the skin being associated with an anabolic action in the liver. Thus, skin sensitivity to tuberculin may be depressed by cortisone-induced biochemical effects, diametrically opposed to those produced in the liver. For instance, it is possible that cortisone might in the allergic animal facilitate the oxidation of ascorbic acid in the carcase and oppose such oxidation in the liver. In this connection it is noteworthy that Mortenson (1953) showed that methionine deficiency increased blood glutathione, but decreased liver glutathione. Caution is therefore needed when interpreting such metabolic change in terms of a single tissue, particularly if that tissue is blood.

With these observations in mind, let us consider acetyl co-enzyme A.

Acetyl co-enzyme A

If co-enzyme-A activity in the guineapig influences the desensitising action of cortisone, the effect is probably due to the sulphur-containing part of the molecule. This functional unit consists of a substance called cysteinamine ($HS—CH_2—CH_2—NH_2$). Professor Bacq first drew my attention to the biological effects of this drug, and provided me both with material and his own (at that time unpublished) data. The evidence suggested that cysteinamine behaved first like an —SH compound and later as an anti-metabolite (Long 1954b). Support for this hypothesis was obtained. A single intraperitoneal injection of cysteinamine, injected at the same time as the tuberculin, prevented desensitisation by cortisone—i.e., it behaved like the —SH compound, reduced glutathione. But, if it was given six hours before the tuberculin, cysteinamine behaved like cortisone and sensitivity was depressed—whether in the presence or in the absence of cortisone. This desensitisation induced by cysteinamine, like the desensitisation induced by cortisone, was prevented either by the injection of reduced glutathione or by a diet deficient in ascorbic acid. From this I concluded that cysteinamine has two actions in the guineapig—an immediate action in which it behaves like an —SH compound, followed by a more prolonged action in which it produces effects analogous to those of cortisone. I suggested that the latter effects may be due to cysteinamine or to one of its breakdown products behaving like an anti-metabolite (Long 1954b). These observations gain greatly by being considered in conjunction with those of Bacq and his colleagues (1953) who found that cysteinamine increased the level of ascorbic acid and of other reducing substances in plasma and urine, and induced liver atrophy, suggesting a disuse atrophy due to a block in metabolism (Long 1954b), —an action diametrically opposed to that of cortisone.

The relation of acetyl co-enzyme A to the metabolic and desensitising effects of cortisone is at present being studied. Interference anywhere on a long chain of metabolic events might have such an effect; interference with a key enzyme could hardly fail to do so. These findings should therefore be accepted with reserve.

A false assumption on the quality of a diet led to a tedious series of experiments on the nutritional value of cabbage (Long et al. 1951a and c, Long 1954a). However, four useful ideas emerged. First, cortisone has no direct effect in the guineapig on tuberculin-sensitivity; it antagonises protein to enable ascorbic acid to initiate desensitisation. Secondly, the biological actions of cortisone and of alloxan show many features in common so that knowledge gained in the study of one may prove valuable when applied to the study of the other. Thirdly, sulphydryl metabolism probably provides the link between bacterial allergy, on the one hand, and cortisone, ascorbic-acid, and protein metabolism on the other. Fourthly, factors that depress sensitivity to tuberculin in the guineapig tend to be diabetogenic; conversely, factors that increase sensitivity to tuberculin are anti-diabetogenic (Long 1954a). This final observation resembles those relating rheumatic fever to diabetes in man (Waksman 1949).

Interpretation of preliminary experiments (Long and Miles 1950, Long et al. 1951b) planned to investigate the relation of hypothyroidism and hyperthyroidism to the action of cortisone upon sensitivity to tuberculin has also been modified in the light of new evidence. Tri-iodothyronine and thyrotrophic hormone, once they became available, made it possible to undertake more accurate experiments than can be achieved with the slow-acting thyroxine. It is probable that thyroxine has little, if any, direct effect on sensitivity to tuberculin in guineapigs,

but that it increases sensitivity indirectly by inducing hyperinsulinism, which in turn increases the —SH content of the tissues (Houssay et al. 1946), and increases sensitivity to tuberculin (Cornforth and Long 1953). Propylthiouracil-induced hypothyroidism also increases the —SH content of the tissues (Houssay et al. 1946) and antagonises cortisone desensitisation; the desensitising action of cortisone being restored by a small dose of thyroxine (Long et al. 1951b). Thus hyperthyroidism and hypothyroidism are associated with hypersensitivity in the guineapig, just as they are associated with susceptibility to rheumatic fever in man. The nutritional and the thyroid-insulin approach both point to sulphydryl metabolism. The effect on wound healing of cortisone in sensitive creatures supports this concept (Shacter and Entenham 1952).

The evidence relating sulphydryl metabolism and sensitivity to tuberculin is good. Cortisone, thyroxine, propylthiouracil, and insulin probably influence sensitivity to tuberculin by their effects upon —SH metabolism (Long 1954a). Growth hormone, on the other hand, depresses sensitivity by some more direct means, for its action is independent of both sulphydryl and ascorbic-acid metabolism (Cornforth and Long 1953). The probable action of cortisone on protein metabolism in the skin, and particularly upon sulphydryl metabolism, is to facilitate the oxidation of ascorbic acid to dehydro-ascorbic acid, for the latter desensitises even in the presence of protein. That oxidation proceeds further than this is unlikely, because such a step is irreversible and cortisone does not induce scurvy in guineapigs—although it is possible that in these cortisone-treated guineapigs loss of ascorbic acid through increased oxidation in the carcase is balanced by decreased oxidation in the liver. Dehydro-ascorbic acid and growth hormone both depress sensitivity to tuberculin (Cornforth and Long 1953) and are diabetogenic, suggesting that both influence sensitivity by their effect on carbohydrate metabolism.

Carbohydrate Metabolism

Attempts to link hormonal effects to various enzyme systems involved in phosphorylation have proved so unconvincing that it may be unwise to attempt to pursue the matter further. The experiments to be described are complex and difficult to interpret, and there is little evidence with which to check the analogy in man. They should be considered as a laboratory gamble at rather long odds, which may or may not yield dividends.

The evidence to support the hypothesis illustrated in fig. 4 depends partly upon effects obtained by the extracellular injection of glucose-1-phosphate or of adenosine triphosphate and diphosphate, and should therefore be accepted with caution. The unorthodox suggestion that glucose-1-phosphate can in fact enter the cell gains support from the recent work of Chain and his colleagues (Beloff-Chain et al. 1953). But there are other reasons for caution: in most species, glucose-1-phosphate is rapidly hydrolysed, and in our initial experiments large doses were used in order to compensate for this effect; but to our surprise glucose-1-phosphate is apparently not rapidly hydrolysed in the guineapig. In spite of the poor quality of the evidence, it was important to check the analogy in man, and the innocuous nature of the material justified such action. Lovell and his colleagues (1953b) showed that glucose-1-phosphate was therapeutically inactive and without effect upon sensitivity to tuberculin in man. The analogy therefore broke down, as eventually all analogies must, unless there is identity, which is of course impossible. The lack of desensitising effect was particularly disappointing, for otherwise evidence might have been obtained as to whether desensitisation and symptomatic improvement were, or were not, associated phenomena.

One hypothesis advanced to explain these findings was:

"... that cortisone facilitates the oxidation of ascorbic acid to dehydroascorbic acid, which inactivates phosphoglucomutase, and thus blocks glycogen breakdown and increases the tissue concentration of glucose-1-phosphate, which is intimately concerned with desensitisation. It was suggested that adenosine triphosphate and insulin oppose this desensitisation by stimulating hexokinase activity, leading to a disappearance of inorganic phosphate which would otherwise be used for glucose-1-phosphate formation from glycogen. This effect is actually enhanced by the glucose formed from protein under the influence of cortisone, more glucose being thus provided for the hexokinase reaction. The desensitisation produced by adenosine diphosphate and by growth hormone was attributed to the effect of these substances in causing breakdown of glycogen to glucose-1-phosphate; with the hormone at least this effect was considered to be due to inhibition of hexokinase activity." (Cornforth and Long 1953.)

The main objection to this hypothesis is its complexity. A simpler hypothesis might be that hexokinase requires —SH activation and uses adenosine triphosphate as a substrate, leading to disappearance of inorganic phosphate, which is associated with increased sensitivity to tuberculin. Cortisone interferes with this system by preventing —SH activation; growth hormone interferes with it by blocking hexokinase activity; so in either case inorganic phosphate becomes available, associated with decreased sensitivity to tuberculin. It is possible that in the allergic guineapig, lack of available phosphate might lead to a temporary deficiency of co-factors or co-enzymes derived from vitamins of the B group (see Bergel 1952). In support of this speculation, we may note that sorbose-1-phosphate, an unnatural metabolite, has desensitising properties (Cornforth and Long, unpublished). The small quantity of glucose-1-phosphate needed to depress sensitivity supports such a concept. Attempts to link acetyl co-enzyme-A activity, —SH metabolism, the B complex, and phosphorylation may eventually elucidate the problem.

SUMMARY

The natural history of rheumatic fever is reviewed in order to select features for study. An experimental animal is chosen in which these features either exist or can be induced. The limitations of experimental pathology in elucidating human disease are discussed.

It is suggested that hæmolytic streptococci cause rheumatic fever; that streptococcal allergens and toxins act synergistically upon mesenchymal cells to produce the rheumatic syndrome in susceptible persons; and that the

TABLE III—ANALOGY BETWEEN RHEUMATIC FEVER IN MAN AND THE B.C.G.-INFECTED GUINEAPIG

	Man (rheumatic fever)	Guineapig (B.C.G.-infected)
Bacterial allergy:		
(Tuberculin type)	−	+
Ascorbic-acid synthesis	−	−
Cortisone:		
1. General resistance	+	+
2. Particular resistance:		
Gamma-globulin synthesis	+	+
Antitoxin synthesis	+	+
3. Anti-allergic action	+	+
4. Anti-inflammatory action	− ?	−
5. Specificity of molecule	+	+
Insulin:		
Diabetogenic agents	↑	↑
Antidiabetogenic agents	↓	↓
Thyroid:		
Hyperthyroidism	↑	↑
Hypothyroidism	↓	↓
—SH:		
(Reduced glutathione)	?	↑
Anti —SH	?	↓

response to streptococcal allergens is of the type seen with tuberculin, not of the type seen in anaphylaxis.

The hypothesis is advanced that susceptibility to rheumatic fever and sensitivity to bacterial allergens amount to the same thing. (The evidence in support of this hypothesis is summarised in table III.) The rheumatic-fever patient and the B.C.G.-infected guineapig are alike (1) in showing bacterial allergy of the tuberculin type; (2) in their inability to synthesise ascorbic acid; (3) in their response to cortisone; and (4) in the fact that their susceptibility is decreased by diabetogenic agents and increased by antidiabetogenic agents and by hyperthyroidism and hypothyroidism.

In the guineapig, sulphydryl compounds, such as reduced glutathione, increase sensitivity to tuberculin; conversely, factors that decrease the non-protein sulphydryl content of the tissues diminish sensitivity to tuberculin. Since the responses of rheumatic man and of the tuberculin-sensitive guineapig have been shown to resemble each other in many ways, it is possible that effects similar to these might be obtained in man.

There is a profound species difference in response to cortisone. Man, monkey, and guineapig are resistant, and the rat, mouse, rabbit, and ferret are sensitive, to its action. Clinical and experimental evidence suggest that the concept of the adaptation syndrome is based on a false analogy and may be misleading when applied to man.

Cortisone does not exert a non-specific anti-inflammatory ("antiphlogistic") action in the skin of the guineapig; it is without effect on acute allergic phenomena but depresses sensitivity to delayed allergic responses of the tuberculin type. It is suggested that cortisone protects guineapig skin from the toxic products liberated by the union of tuberculin antibody and allergen. The desensitising action of sphingosine and of the polyoxyethylene ethers supports the hypothesis that cortisone decreases cell permeability, thus reducing the size of the lesion by preventing the outflow of toxic substances from the damaged cells. It is unlikely that cortisone exerts this anti-allergic activity by inducing qualitative or quantitative changes in antibody or by interfering with the union of antibody and allergen.

The desensitising effect of cortisone is certainly indirect. Cortisone antagonises protein in general and methionine in particular to facilitate desensitisation by ascorbic acid, but desensitisation is more closely linked with carbohydrate than with protein metabolism. It is suggested that cortisone impairs —SH synthesis in the skin of the guineapig, thus facilitating the oxidation of ascorbic acid to dehydro-ascorbic acid, which increases the local concentration of glucose-1-phosphate, leading to desensitisation. Cortisone transfers carcase protein to viscera. Protein katabolism in the carcases occurs concurrently with protein anabolism in the liver and kidney. It is therefore possible that, in the liver, cortisone assists —SH synthesis and maintains ascorbic acid in the reduced state.

The study in the collagen diseases of plasma-protein metabolism and of liver function provides an important and neglected field for study.

I gratefully acknowledge the help of my colleagues. But, above all, I am indebted to Sir Charles Harington, F.R.S., who from the beginning of this work has provided me with every possible facility and encouragement.

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SYMPATHECTOMY BY THE AXILLARY APPROACH

H. J. B. ATKINS
D.M., M.Ch. Oxfd, F.R.C.S.
DIRECTOR, DEPARTMENT OF SURGERY, GUY'S HOSPITAL, LONDON

IN 1949 I wrote a short account of the technique of removing the upper part of the sympathetic chain through the axilla—an operation which I had then performed 8 times. Having now done 42 of these operations on 26 patients, I am better able to discuss the advantages and disadvantages of the approach. The conditions for which sympathectomy was undertaken were:

	Patients	*Operations*
Raynaud's disease	18	28
Thrombo-angiitis obliterans	3	6
Causalgia	1	1
Hyperhidrosis	3	6
Cardiac pain	1	1
	26	42

In this report I shall not discuss how far it relieved these conditions: the results, as might be expected, were no better and no worse than those of sympathectomy performed by other routes. I shall confine myself therefore to the method and complications of the operation.

Method

The procedure was devised by W. G. Schulze and Prof. R. H. Goetz at the Groote Schuur Hospital, Cape Town.

When performed for peripheral vascular disease, hyperhidrosis, or causalgia of the arm, forearm, or hand, the operation consists in removal of the 2nd and 3rd thoracic ganglia with the intervening chain; or alternatively (if strictly preganglionic sympathectomy is desired) in section of the chain below the 3rd ganglion and of the white rami to this ganglion and to the 2nd.

The patient is placed in the lateral position and wedged suitably on the table. The uppermost arm is extended to about 120°, drawn forwards, and placed on an arm-rest. It is important not to hyperextend the arm too far over the head, because on one occasion, after the second of these operations which I performed, a temporary brachial plexus palsy developed—probably because during the operation I leant on the hyperextended arm.

An incision is then made obliquely across the axilla in the line of the 2nd intercostal space. The obliquity of this incision depends upon the obliquity of the ribs in the particular patient, which can be assessed by palpation of the axilla. The incision stretches from the latissimus dorsi posteriorly to the pectoralis major anteriorly. Either of these muscles may be partially incised, but I have found this to be necessary on only a very few occasions when some fibres of the pectoralis major were incised to give better exposure.

The incision is deepened through fat and glandular tissue down to the intercostal space, partly with the knife and partly with a gauze sponge stretched over both index fingers to sweep the tissues aside. It must be borne in mind that in the posterior part of the wound lies the long thoracic nerve, the only structure of importance to be avoided. Usually I do not see this nerve, but if the intercostal incision has to be prolonged backwards I am careful to expose it.

The 2nd intercostal space having been exposed and identified, an incision is made through the intercostal muscles—a process which, because of the obliquity of the fibres in this region, is often more of a scratching than a clean incision. After the anæsthetist has been warned, the pleural cavity is entered by penetration with the finger to avoid injury to the underlying lung. A retractor is then placed between the 2nd and 3rd ribs: and the best instrument for this purpose is half of a Tudor Edwards spreader, with the crossbar removed. I have found that a Tuffier retractor is not strong enough. The intercostal space is forcibly enlarged to about $1^1/_2$–2 inches. This must be done very slowly, to obviate pain after the operation; it should take several minutes, during which time the stretched intercostal muscles may be cut forwards and backwards. The lung is allowed to collapse, and a moist gauze roll, 3 inches wide, is inserted into the pleural cavity, which, with the tail of the roll outside the wound, helps to keep the lung out of the way. A deep curved Ogilvie retractor is inserted, together with a malleable light.

It is now possible to see satisfactorily the upper part of the thoracic sympathetic chain shining through the parietal pleura. The adjacent intercostal veins, which in other approaches may cause trouble, can be readily identified and avoided. I find it best to identify the stellate ganglion and the 2nd thoracic and 3rd thoracic ganglia before the parietal pleura over them is disturbed; otherwise the slight oozing, which occurs as soon as the pleura is incised, tends to mask the anatomy of these parts. In order to identify them, a pair of lobectomy scissors is inserted into the cavity, and the neck of the highest rib is found by palpation with the scissors. The ganglion lying on this rib is the stellate ganglion, and it is the two ganglia below this which must be removed.

At this stage the pleura is incised with a special long-handled knife, fitted with a no. 12 Bard Parker blade, which has a rather scythed or hooked shape. The special knife handle is that which was devised by Professor Brodie Hughes of Birmingham, and which I use in operations for hypertension. The pleura is incised over the required distance and the sympathetic chain seized immediately below the 3rd ganglion. By dissection with the no. 12 Bard Parker blade and long-handled lobectomy scissors, together with pledgets of gauze held on long artery-forceps, this chain is dissected up and the required length removed. The malleable light, retractor, and gauze roll having been withdrawn, the Tudor Edwards spreader is released and the lung expanded by the anæsthetist.

No closure is necessary other than approximation of the fat with a few interrupted stitches and suturing the skin with continuous 'Nylon.' The patient may get up on the next day.

Complications

After the operation an X-ray photograph of the chest was taken as a routine in order to detect a pleural effusion or pneumothorax. Examination was made for surgical emphysema and an attempt was made to assess the degree of postoperative pain. If this pain was no more than might be anticipated after any minor operation and required no more sedation than is commonly necessary after the operation for repair of hernia, this symptom was not listed as a complication. If, on the other hand, the pain was complained of spontaneously by the patient, was prolonged for more than forty-eight hours, or required additional drugs for its relief, it was so listed.

By these criteria an analysis of the complications after 42 operations can be made.

29 of the operations were followed by no complications.

1 case, the second in the series, complained of weakness of the small muscles of the hand due to a partial brachial-plexus palsy and caused undoubtedly by the hyperextended position of the arm used in the first two operations. The weakness recovered after four months, and this complication has not been met with again after adopting a more moderate degree of abduction.

After 2 operations, X-ray examination revealed a small apical pneumothorax which had resolved spontaneously when a second radiograph was taken a week later.

1 case had surgical emphysema over the front of the chest spreading up into the neck on both sides after operation on one side. This emphysema disappeared after ten days. Pain was complained of both over the scapula behind and the pectoral muscle in front. No cause could be assigned to this pain and it eventually subsided.

1 case had a small basal effusion, detected on radiography, which resolved after ten days.

1 case had a small basal effusion which, four weeks later, increased suddenly during an attack of heart-failure and œdema of the legs from which she recovered. In this case, which was the one operated upon for cardiac pain, aspiration was required twice. Each time over a pint of fluid was withdrawn from the chest.

1 case complained of surgical emphysema, and X-ray examination showed a small apical pneumothorax. Both complications had disappeared within ten days.

1 case had radiographic evidence of a pleural effusion and a pneumothorax. Both were symptomless and both had disappeared after a second radiograph in ten days' time.

1 case had surgical emphysema, and X rays showed both a pleural effusion and an apical pneumothorax. All these complications had disappeared within ten days.

2 patients complained of pain. In 1 of them it was pleuritic, being aggravated on deep breathing, but there was no X-ray evidence of effusion either at the time or subsequently. In the other case the pain radiated down the arm and was probably due to too rapid expansion of the intercostal space. All instances of pain of this nature occurred early in the series. In both the above patients the pain had disappeared after a fortnight.

1 patient complained of pain of a pleuritic type which disappeared after a week, and radiography showed a small apical pneumothorax.

1 patient complained of two types of pain—one pleuritic and the other a lancinating pain radiating down the arm. Radiography of the chest was normal, but there was slight surgical emphysema over the clavicle, supraclavicular fossa, and axilla of the same side. All pain had disappeared in a fortnight.

None of the above complications was serious and few gave rise to symptoms. The majority would have gone undetected but for the special investigations undertaken to reveal them. In 1 case pleural effusion required aspiration; but as this effusion was associated with gross œdema elsewhere and came on four weeks after the sympathectomy, the operation, though contributory, cannot be held directly responsible. No other effusions would have been noticed if X-ray examinations had not been undertaken.

A small pneumothorax was of interest in a few cases only, and never gave rise to symptoms. Surgical emphysema would not have been noticed by the patients if their attention had not been drawn to it by the careful search for its presence—except in 1 case where it caused fullness of the neck on both sides which was remarked upon by the patient. In all cases with surgical emphysema there were slight adhesions between the apex of the lung and the dome of the pleura which had been gently brushed or dissected away. No doubt some of these adhesions contained air, and after the operation this escaped into the tissues.

5 patients complained of pain; and perhaps a little pleuritic pain, for a short time, is inevitable in a very small proportion of cases. The 2 cases having pain shooting down the arm were operated upon early in the series, and the pain was probably due to too rapid stretching of the intercostal space. No pain of consequence has complicated the last 22 operations.

Advantages

Having now ablated the upper part of the sympathetic chain using the anterior, the posterior, and the axillary approaches to an almost exactly equal extent, I shall venture to give a personal view of the value of the last operation in comparison with the two former.

Simplicity.—If the purpose of the operation is to expose the thoracic sympathetic chain below the 3rd ganglion, without interfering with the stellate ganglion itself, the axillary approach is incomparably the easiest. Thus, the 2nd and 3rd thoracic ganglia are preferably removed via the axilla. Removal of the 4th or 5th ganglia, which may be necessary when operating for cardiac pain, cannot be done conveniently except by this approach. If the stellate ganglion is to be exposed together with the chain as low as the 3rd ganglion, there is not much to choose between the axillary approach and the anterior approach, so far as ease of performance is concerned; for the stellate ganglion may be a little awkward of access through the axilla, and the 3rd ganglion may be very difficult to define through an anterior approach. If the stellate ganglion only is to be removed, the anterior approach is the best.

Accuracy.—Through the axilla the sympathetic chain can be seen clearly in the upper part of its extent, and precise localisation of the ganglia is possible. On 8 occasions this operation was performed after the anterior approach had been used by other surgeons, allegedly to remove the chain as low as the 3rd ganglion. In 2 of these the surgeons who performed the first operation had had special experience of operating on the sympathetic system, but in 1 instance the resection clearly had stopped short at the stellate ganglion, and in the other it had stopped at the 2nd thoracic ganglion. In the remaining 6 the operation had been inadequate. Whatever is said to the contrary, it would appear that, using the anterior approach, it is sometimes impossible to be certain that the chain has been exposed as low as the 3rd ganglion.

The axillary approach compares favourably with the posterior approach in regard to accuracy and is more reliable in this respect than the anterior approach.

Control of Hæmorrhage.—Bleeding from the thin-walled intercostal veins, which are exposed over a considerable part of their course, is readily controlled by pressure and afterwards arrested by diathermy or by the application of metal clips.

With both the anterior and posterior approaches, I have myself had difficulty in controlling hæmorrhage from these veins and from the vertebral vein; and I have seen surgeons of experience with these approaches in similar difficulties. These worrying incidents have not so far occurred when the axillary route has been used.

Conservation of Tissues.—In the axillary approach the only tissues cut, other than the sympathetic chain itself, are the skin, fat, intercostal muscles, and pleura. An equivalent degree of tissue disturbance is produced by the anterior approach. The posterior approach, however, is far more traumatic, because it involves resection of rib and the mutilation of bulky muscle to a considerable depth.

Appearance of the Wound.—The incision in the axilla heals well and is unnoticeable. In this respect the axillary approach has a slight advantage over the anterior, where the incision, although usually perfectly healed in a hair-line, is nevertheless noticeable; and it has a great advantage over the posterior approach where the incision often heals badly with a depressed and unsightly scar.

Disadvantages

The operation cannot be performed on both sides at the same session, an interval of a week being necessary between the two operations.

If, in a case showing vascular abnormality of the hands and fingers, there is some doubt about the diagnosis as between peripheral vascular disease and the costo-clavicular syndrome, one cannot investigate the latter possibility at the time of the operation as can be done with the anterior approach.

A history of phthisis contra-indicates the axillary approach. Adhesions between the apex of the lung and the dome of the pleura may be avoided by stripping the parietal pleura away from the chest wall and making an extrapleural approach, but the manipulation of the apex of the lung which this manœuvre involves would be undesirable in a case of old phthisis.

Summary and Conclusion

A method of exposing the upper part of the sympathetic chain through the axilla is described. The complications following the first 42 such operations are analysed, and an attempt is made to assess the value of the axillary approach compared with the standard anterior and posterior approaches.

Whereas in 1949 I advocated serious consideration for this method I now go further and recommend its use in suitable cases.

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STREPTOMYCIN REACTIONS

RELATION TO EXERCISE

H. R. C. RICHES
M.B. Lond., M.R.C.P.

RESIDENT MEDICAL OFFICER, BROMPTON HOSPITAL SANATORIUM, FRIMLEY, SURREY

A RELATIVELY large number of patients experience unpleasant symptoms within a few hours of an intramuscular injection of streptomycin. In most of them these "reactions" are trivial, but in some they are extremely unpleasant and may render the patient incapable of work.

Such reactions occur less commonly in patients resting in bed. Therefore the present investigation was undertaken to elucidate the cause of these reactions to streptomycin, with special reference to the part that exercise plays in their ætiology.

Material

91 patients in the Brompton Hospital Sanatorium who were having, or had had, streptomycin were questioned about whether streptomycin had affected them in any way. Leading questions were deliberately avoided as much as possible.

The various unpleasant symptoms reported were tingling paræsthesiæ in and around the mouth, vertigo, ataxia, headaches, lassitude, "muzziness in the head," a sensation of tightness of the skin around the eyes, and difficulty in visual accommodation.

Of the 91 patients treated with streptomycin 31 (34%) complained of toxic symptoms on the day of injection. The frequency with which the various toxic symptoms occurred was as follows:

Symptom	*No. of patients affected*
Paræsthesiæ in and around the mouth	24
Vertigo and ataxia	11
Headaches	9
Lassitude and "muzziness in the head"	9
Sensation of tightness of the skin around the eyes	2
Difficulty in visual accommodation	1

The severity of the reactions was classified into three grades (see table).

The symptoms usually began within 1–3 hours of an injection of streptomycin, and some or all persisted for 1–24 hours.

Investigation

Of the 12 patients with moderate or severe reactions 8 complained that their symptoms were made worse by exercise and relieved, partially or completely, by rest. It was therefore decided to investigate the serum-streptomycin levels following an intramuscular injection of streptomycin sulphate in 5 patients, both at rest and during exercise.

SEVERITY OF REACTIONS

No. of patients	Severity of reaction		
	+	++	+++
Males 12	6	2	4
Females 19	13	5	1

+, Trivial reaction.
++, Definitely unpleasant reaction.
+++, Reaction severe enough to interrupt the patient's daily routine.

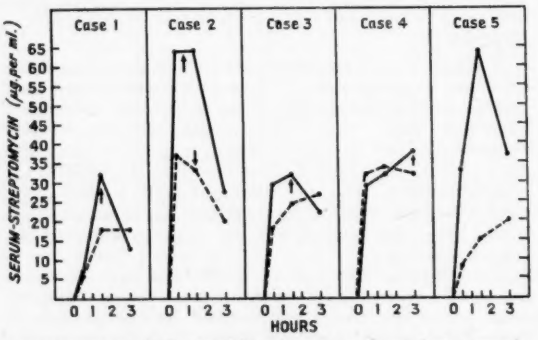
The serum-streptomycin levels at rest and during exercise were determined on consecutive days for each patient. On the first day the patient rested in bed, and samples of venous blood were taken immediately before and ½ hour, 1½ hours, and 3 hours after an intramuscular injection of streptomycin sulphate 1 g. into the buttock. The same procedure was repeated on the following day, but with the patient ambulant and taking walking exercise in the grounds of the Sanatorium.

The serum-streptomycin levels were all determined at the Brompton Hospital laboratory by the diffusion method of Mitchison and Spicer (1949).

Results

In all 5 patients the highest blood-streptomycin level was found during activity, the peak level occurring 1½ hours after the injection of streptomycin in 4 of the 5 patients. In the remaining patient the highest blood-streptomycin level was found 3 hours after the injection.

3 patients had reactions only when they were active, and the time of onset of these reactions corresponded closely to the time that the streptomycin was reaching its peak level in the blood. 1 patient had a reaction whilst resting, but this was less severe than that which he had during activity. The remaining patient had no reaction during the test.



Serum-streptomycin levels of 5 patients at rest and during exercise after intramuscular injection of streptomycin 1 g.: continuous line, during exercise; interrupted line, at rest; arrows mark onset of reactions.

The serum-streptomycin levels of the 5 patients at rest and during activity are shown in the accompanying figure.

Treatment

It is a common practice in sanatoria to give patients their injections of streptomycin first thing in the morning, before the start of the day's activity. But, because rest after the injection appeared to diminish or prevent subsequent reactions, 5 patients who experienced reactions were given their streptomycin at night, shortly after retiring to bed. With this regimen, 3 patients obtained complete relief from symptoms and 1 was considerably improved. The remaining patient (case 2, see figure) complained that he was not improved, because he was left with a headache the following morning.

Discussion

I have not been able to find any published report of transient, toxic reactions following intramuscular streptomycin as described here, nor any reference to the influence of exercise on the rate of absorption of intramuscular streptomycin.

It is perhaps surprising that unpleasant symptoms occurring as frequently as in this series should not have attracted more attention. In many cases, of course, the symptoms are only trivial; but, even if these are ignored, there still remain a significant number (13%) of patients in whom the reactions are more serious. One can only suppose that in the past, when streptomycin was usually given in relatively short courses to bed-patients, the reactions caused little concern, since, with the patient at rest, the blood-streptomycin level remains lower and there is less likelihood of reactions.

With the present-day tendency to give long courses of streptomycin to ambulant patients, however, these reactions become more important, especially if the patients are to continue streptomycin therapy after returning home and beginning work.

The onset of a reaction appears to coincide fairly closely with the peak blood-streptomycin level, which is usually attained 1–1½ hours after an injection in ambulant patients. In this investigation all the reactions began when the serum-streptomycin level had risen higher than 30 µg. per ml.

The effect of exercise on the rate of absorption of a drug given intramuscularly does not appear to be fully appreciated, since many papers citing serum-streptomycin levels do not stipulate whether the patients investigated were resting or ambulant (Hunt and Fell 1949, Kornegay et al. 1946, Zini 1950).

That activity should influence the rate of absorption is quite logical, since it is well known that the blood-flow through a muscle, and the lymph return from it, are both considerably increased with exercise. It is not unreasonable to suppose, therefore, that an injection of streptomycin given into the leg or the buttock will be more quickly absorbed in an ambulant patient than in one who is resting. This supposition has been confirmed in 4 of the 5 cases so far investigated. The more rapid absorption of streptomycin during activity and the higher blood-streptomycin levels attained, may be factors in the ætiology of these reactions.

The study of a larger series of cases is being undertaken to establish the best method of preventing these unpleasant reactions. Meanwhile the findings in this small series strongly suggest that a period of rest following the administration of streptomycin may be of benefit to those patients who experience reactions. This can be achieved quite simply by giving the injections in the evening.

Summary

Of 91 patients treated with intramuscular streptomycin 31 (34%) complained of toxic symptoms within a few hours of the injection.

These reactions occurred less commonly when patients were resting.

The blood-streptomycin level during exercise is generally higher than that found during rest.

A period of rest following the administration of streptomycin may be of benefit to those patients who experience reactions.

I wish to thank the physicians of Brompton Hospital for permission to investigate their patients; Dr. J. L. Livingstone and Dr. A. F. Foster-Carter for the encouragement and advice they gave me during this investigation; Dr. J. W. Clegg for granting me laboratory facilities at the Brompton Hospital; and Mr. F. J. Baker and Miss M. A. Swan, of the bacteriology department, Brompton Hospital, for doing all the technical work.

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"If statistics or information about road accidents could, by themselves, prevent casualties the roads would indeed be safe. If every thousand words written about them could save a life there would be few if any fatal accidents during the year. But the casualty rate still mounts. One hundred and eighty thousand killed or injured in 1949, two hundred and sixteen thousand in 1951, two hundred and twenty-six thousand in 1953. The greater the number of casualties the more does each organisation of road users try to impute the blame to others. Progress will be only slow and halting if individuals and organisations alike see the primary solution of the problem as someone else's responsibility."—The Price of Road Safety, *Planning*, March 10, 1954. Published by P.E.P, 16, Queen Anne's Gate, London, S.W.1.

CORTICOTROPHIN ZINC PHOSPHATE AND HYDROXIDE

LONG-ACTING AQUEOUS PREPARATIONS

J. D. H. HOMAN, Ph.D. Groningen
G. A. OVERBEEK, Ph.D. Leiden
J. P. J. NEUTELINGS
C. J. BOOIJ
J. VAN DER VIES

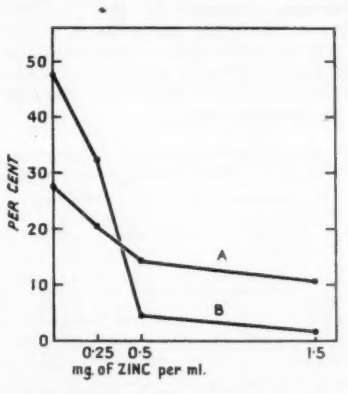
From the Research Laboratories of N. V. Organon, Oss, Holland

VARIOUS attempts have been made to produce preparations of adrenocorticotrophic hormone (corticotrophin) with increased or prolonged action, so as to obtain more efficient utilisation of corticotrophin after either intramuscular or subcutaneous injection. In these preparations corticotrophin is combined with different and more or less complex substances which delay absorption (Wolfson et al. 1951, Raben et al. 1952, Fletcher and Williams 1952, Holtermann and Thorsdalen 1953) or are intended to inhibit enzymatic destruction of the hormone (Hamburger 1952, Fischer et al. 1953).

Since it is known that zinc salts can potentiate or retard the action of certain protein hormones (Maxwell 1934, Rabinowitch et al. 1936, Scott and Fisher 1935, 1936), and that zinc inhibits several kinds of protein-splitting enzymes (Bang 1946, Adams and Smith 1951, Green et al. 1952) the influence of zinc salts on the action of corticotrophin was investigated.

The experiments showed that both zinc phosphate and zinc hydroxide, when precipitated from a solution containing corticotrophin at about neutral pH, carry the corticotrophin activity with them. In this way easily injectable suspensions of small particle-size can be obtained. The active material and enzyme-inhibiting zinc compounds are slowly released by solution in tissue fluids after subcutaneous or intramuscular injection of the suspension.

Experiments were made in which the distribution of corticotrophin in preparations containing zinc phosphate was studied, starting with corticotrophin prepared from pig pituitaries. The activities of these preparations varied between 1 and 3 *United States Pharmacopeia* (*U.S.P.*) units per mg. Occasionally use was made of further purified corticotrophin preparations obtained by the oxycellulose method of Astwood et al. (1951). The results of one of the experiments are presented in the accompanying figure, showing the relative amount of total protein (curve A) and activity (curve B) left in solution at various concentrations of zinc phosphate in systems at pH 6 containing 20 *U.S.P.* units of corticotrophin per ml. After a sharp initial drop the curves flatten out. The zinc-phosphate precipitates were obtained by the addition of trisodium phosphate to an acid solution containing corticotrophin and zinc chloride, followed by adjustment of the pH to 6 with sodium-hydroxide solution. The protein was determined



Amounts of protein (A) and activity (B), in % of original value, present in the liquid phase of corticotrophin-zinc-phosphate suspensions (each containing 20 U.S.P. units) with different amounts of zinc at pH 6·0; temperature = 25°C; corticotrophin preparation no. 54/55 (2·6 U.S.P. units per mg.).

TABLE I—COMPOSITION AND ACTIVITY OF SOME TYPICAL CORTICOTROPHIN-ZINC SUSPENSIONS

Corticotrophin (starting material)	Suspension no.	Corticotrophin (units per ml.)	Zinc (mg. per ml.)	Corticotrophin carrier	Activity	
					Liver-glycogen test	Thymus test
No. 48; 3·3 *U.S.P.* units per mg.	PRD 2/55	20	1·5	Zinc phosphate	$p = 173$	$n > 10$
No. 54/55; 2·6 *U.S.P.* units per mg.	PRD 2/64	20	1·5	Zinc phosphate	$p = 112$	
	8117	20	1·5	Zinc hydroxide	$p = 126$	$n > 15$
No. 45; 2·4 *U.S.P.* units per mg.	Res P 348	10	0·8	Zinc phosphate	$p = 137$	$n = 19$
No. 2148; 36 *U.S.P.* units per mg. (purified with oxycellulose)	2148 – P	20	1·0	Zinc phosphate	$p = 100$	
	2148 – H	20	1·0	Zinc hydroxide	$p = 63$	
	8143 – H	5	0·4	Zinc phosphate		$n = 32$

by a quantitative biuret method (Gornall et al. 1949). Corticotrophin activity was tested by the ascorbic-acid depletion method of Sayers et al. (1948).

Curve A in the figure represents the amount of non-precipitated protein related to the concentration of zinc. As a rule quantities of zinc phosphate corresponding to 1–2 mg. of zinc per 20 units of corticotrophin were used in preparations that showed good responses in biological and clinical trials. Since the concentration of active material in the liquid phase of the suspensions is only small, destruction of corticotrophin arising from the neutral reaction of the system is not to be expected. Phosphate-free preparations containing zinc hydroxide show similar behaviour, provided the pH is about 7·5. A quantitative expression for prolonged and increased action can be obtained from the results of a liver-glycogen test on hypophysectomised rats. Details of this method will be published elsewhere. Liver glycogen is determined as follows:

(1) Eight hours after a single subcutaneous injection of 1 unit of corticotrophin in aqueous solutions (*a*).

(2) After administration of the same dose in aqueous solution, divided into eight hourly injections (*b*).

(3) Eight hours after a single injection of 1 unit of the same preparation of corticotrophin in the long-acting suspension (*c*).

The quantity $p = \dfrac{\log c - \log a}{\log b - \log a} \times 100$ appeared to be a suitable index for prolonged action. For $p = 0$ there is no prolonged action; for $p = 100$ or more the effect of the suspension equals, or is even stronger than, the action of the same dose of corticotrophin in aqueous solution divided into eight hourly doses. In table I the values of p for some typical suspensions are presented. In addition some results obtained in the thymus-involution test (Bruce et al. 1952) are reported. The number n indicates that an n-fold dose of corticotrophin in aqueous solution had to be given to obtain a reduction in weight of the thymus comparable with that produced by a given dose of corticotrophin zinc.

TABLE II—EFFECT OF RAT SERUM ON ACTIVITY OF CORTICOTROPHIN AND CORTICOTROPHIN ZINC PHOSPHATE IN VITRO

—	Corticotrophin + serum		Corticotrophin zinc + serum	
	No. of rats	Adrenal ascorbic-acid depletion (μg. per 100 mg.)	No. of rats	Adrenal ascorbic-acid depletion (μg. per 100 mg.)
1st experiment:				
Incubated ..	9	17 ± 8	10	76 ± 11
Not incubated ..	10	109 ± 8	11	87 ± 9
Statistical data ..	$t_{17} = 7·9$; $P < 0·001$		$t_{19} = 0·77$; $P > 0·4$	
2nd experiment:				
Incubated ..	14	22 ± 13	12	124 ± 8
Not incubated ..	12	120 ± 12	12	134 ± 14
Statistical data ..	$t_{24} = 5·4$; $P < 0·001$		$t_{22} = 0·56$; $P > 0·5$	

Eosinophil-counts on dogs revealed reductions lasting twenty to forty hours, whereas the effect of corticotrophin in aqueous solution is usually ended after eight hours.

The fact that the presence of zinc phosphate protects corticotrophin from destruction by serum enzymes was demonstrated by the following two in-vitro experiments. Corticotrophin 8 *U.S.P.* units was mixed with 1 ml. of rat serum and left overnight at room-temperature. The corticotrophin activity was thereafter determined by the ascorbic-acid depletion test of Sayers et al. (1948) and compared with that of a freshly prepared mixture. The same was done with the zinc-phosphate preparation of corticotrophin. The average decreases (in μg. of ascorbic acid per 100 mg. of adrenal) are given in table II. The inactivation of ordinary corticotrophin is very significant, whereas the corticotrophin zinc shows good stability in the presence of serum.

The clinical trials were made with suspensions containing zinc phosphate (Greene and Vaughan-Morgan 1954, Ferriman et al. 1954, den Oudsten et al. 1954). Since the corticotrophin carrier zinc phosphate tends to crystallise in the suspensions on storage, leading to an increase in dissolved corticotrophin and hence in a decrease of prolonged action, suspensions for clinical use were freshly prepared. This was easily done by mixing an acid solution of corticotrophin and zinc chloride (pH 3) with a solution containing trisodium phosphate and sodium hydroxide to yield a suspension of the right composition and pH, the amount of zinc being chosen from the flat part of the curve in the figure. Corticotrophin-zinc solutions at pH 3 showed excellent stability and retained their ability to form long-acting suspensions even after storage at raised temperatures—e.g., six weeks at 45°C.

Summary

Corticotrophin preparations with increased and prolonged action are obtained by combining zinc phosphate or zinc hydroxide in aqueous solutions of corticotrophin at pH values about neutrality. In this way about 99% of the total activity is precipitated, forming easily injectable suspensions. These preparations show prolonged and/or increased activity in the liver-glycogen test on hypophysectomised rats, in the eosinophil test on dogs, and in the thymus-involution test.

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CORTICOTROPHIN ZINC PHOSPHATE
A LONG-ACTING AQUEOUS PREPARATION

RAYMOND GREENE
M.A., D.M. Oxfd, M.R.C.P.
PHYSICIAN, ROYAL NORTHERN HOSPITAL AND NEW END HOSPITAL, LONDON

JOSEPHINE VAUGHAN-MORGAN
B.Sc. Lond.
BIOCHEMIST, DEPARTMENT OF ENDOCRINOLOGY, NEW END HOSPITAL, LONDON

THE efficacy of corticotrophin varies roughly with the frequency and route of its administration. For this reason 10 mg. given daily by continuous intravenous infusion may on occasions have a similar effect to that of 100 mg. given intramuscularly in four divided doses over the same period.

There are so many obvious objections to prolonged intravenous administration that many attempts have been made to evolve a method by which a prolonged effect could be produced by a single intramuscular or subcutaneous injection, the most successful so far having been a mixture of corticotrophin with gelatin, which is, however, not easy to inject. For reasons given by our collaborators Homan et al. (1954) it was thought that a combination of corticotrophin with zinc might be more satisfactory. The clinical condition and the excretion of 17-ketosteroids were used as indicators of corticotrophin activity, in each case the effects of corticotrophin zinc phosphate being compared with those of simple corticotrophin.

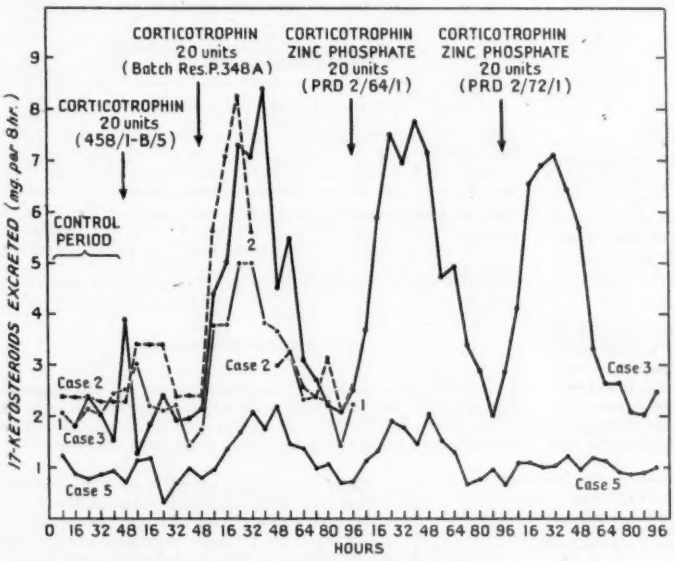

Fig. I—Excretion (mg. per 8 hr.) of 17-ketosteroids in cases 1, 2, 3, and 5.

TABLE I—RESULTS IN CASE 1

Date 1953	17-ketosteroid excretion (total neutral fraction) during each 8-hr. period (mg.)			Total excretion per 24 hr. (mg.)
	10 A.M.–6 P.M.	6 P.M.–2 A.M.	2 A.M.–10 A.M.	
March 5 ..	2·97	1·54	2·75	7·26
,, 6 ..	2·39	1·54	1·66	5·59
,, 7 ..	2·09	1·70	2·16	5·95
,, 8 ..	2·07	2·44	2·52	7·03
Corticotrophin 20 units given at 10 A.M. on March 9				
March 9 ..	3·03	2·20	2·13	7·33
,, 10 ..	2·22	1·40	1·75	5·37
Corticotrophin zinc phosphate 20 units given at 10 A.M. on March 11				
March 11 ..	3·77	3·78	5·00	12·55
,, 12 ..	5·00	3·80	3·64	12·44
,, 13 ..	3·26	2·31	2·38	6·95
,, 14 ..	2·27	1·41	2·25	5·93

Method

Total neutral 17-ketosteroids were estimated by the method of Tompsett and Oastler (1946) modified by Greenburgh et al. (1950).

Estimations were made on eight-hour specimens of urine in cases 1, 2, 3, 5, and 7, and on six-hour specimens in cases 4 and 6 (see tables). Since the exact value of the 17-ketosteroid output was not required for diagnostic purposes, the method used for assessing the variation in steroid output in these cases was chosen because it was relatively quick and simple. The error due to the presence of non-specific chromogens was shown by Werner (1941) to be fairly constant from day to day and to yield a colour equivalent to that given by about 2 mg. of 17-ketosteroids a day.

For this experiment 6 patients were chosen: 3 women with active severe rheumatoid arthritis, 1 woman with atopic eczema, 1 man with rheumatoid arthritis (whose case clearly provided a less simple guide), and 1 man with Simmonds's disease due to a pituitary tumour.

Clinical Results

Case 1.—A woman, aged 44, with rheumatoid arthritis of six years' duration. Hæmoglobin 76%. Corrected erythrocyte-sedimentation rate (E.S.R.) 37 mm. in one hour (Wintrobe). Corticotrophin 20 units intramuscularly produced no improvement in symptoms. The output of 17-ketosteroids, which in the previous four days had been 5·6–7·3 mg. in twenty-four hours,

TABLE II—RESULTS IN CASE 2

Date 1953	17-ketosteroid excretion (total neutral fraction) during each 8-hr. period (mg.)			Total excretion per 24 hr. (mg.)
	10 A.M.–6 P.M.	6 P.M.–2 A.M.	2 A.M.–10 A.M.	
March 6 ..	4·50	2·84	3·04	10·38
,, 7 ..	..	..	..	10·80
,, 8 ..	..	..	..	6·40
,, 9 ..	..	..	..	7·20
,, 10 ..	..	..	..	6·90
Corticotrophin 20 units given at 10 A.M. on March 11				
March 11 ..	..	..	..	10·30
,, 12 ..	..	..	..	7·10
Corticotrophin zinc phosphate 20 units given at 10 A.M. on March 13				
March 13 ..	5·62	7·10	8·25	20·97
,, 14 ..	5·60	Lost	2·98	..
,, 15 ..	3·26	2·60	2·35	8·21
,, 16 ..	3·15	2·01	2·62	7·78

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TABLE III—RESULTS IN CASE 3

Date 1953	17-ketosteroid excretion (total neutral fraction) during each 8-hr. period (mg.)			Total excretion per 24 hr. (mg.)
	2 P.M.–10 P.M.	10 P.M.–6 A.M.	6 A.M.–2 P.M.	
July 15 ..	..	1·73	2·42	..
„ 16 ..	2·08	1·55	3·92	7·55
Corticotrophin 20 units given at 2 P.M. on July 17				
July 17 ..	1·26	1·78	2·40	5·44
„ 18 ..	1·94	1·96	2·15	6·05
Corticotrophin zinc phosphate batch A 20 units given at 2 P.M. on July 19				
July 19 ..	4·40	5·00	7·30	16·70
„ 20 ..	7·05	8·40	4·52	19·97
„ 21 ..	5·47	3·08	2·68	11·23
„ 22 ..	2·22	2·07	2·52	6·81
Corticotrophin zinc phosphate batch B 20 units given at 2 P.M. on July 23				
July 23 ..	3·67	5·85	7·50	17·02
„ 24 ..	6·95	7·75	7·15	21·85
„ 25 ..	4·70	4·90	3·38	16·98
„ 26 ..	2·89	1·99	2·86	7·74
Corticotrophin zinc phosphate batch C 20 units given at 2 P.M. on July 27				
July 27 ..	4·08	6·50	6·85	17·43
„ 28 ..	7·07	6·42	5·70	19·19
„ 29 ..	3·32	2·64	2·63	8·59
„ 30 ..	2·05	2·01	2·45	6·51

was unaffected (7·3, 5·4 in succeeding days). Corticotrophin 20 units zinc phosphate was next injected. A satisfactory clinical improvement was manifested in the first twenty-four hours and was maintained for five days (table I and fig. 1). The output of 17-ketosteroids within a few hours and the total excretion in the succeeding two days was about doubled. The E.S.R. dropped to 6 mm. in one hour. The patient has been moderately well maintained since on 10 units daily.

Case 2.—A woman, aged 47, with rheumatoid arthritis of twelve years' duration. Hb 65%. E.S.R. 20 mm. in one hour. Corticotrophin 20 units produced no subjective improvement. The output of 17-ketosteroids, which had previously been 6·4–10·8 mg. in twenty-four hours, was not significantly changed. After the injection of corticotrophin zinc phosphate 20 units a rapid subjective improvement took place which lasted thirty-six hours. The output of 17-ketosteroids increased to double its previous maximum (table II and fig. 1). Owing to the loss of an eight-hour specimen of urine it is impossible to say how long the effects lasted, but the large output of 17-ketosteroids seems to have been maintained for about the same time as the symptomatic improvement. It was difficult to determine the proper maintenance dose in this patient, who was psychologically ill balanced, but she is leading a fairly normal life on a dosage of 15 units daily.

Case 3.—A woman, aged 53, with rheumatoid arthritis of one and a half years' duration. Hb 78%. E.S.R. 45 mm. in one hour. Corticotrophin 20 units produced a slight clinical improvement which lasted twenty-four hours, but there was no increase in the output of 17-ketosteroids. One batch of corticotrophin zinc phosphate had a slightly longer symptomatic effect and increased the output of 17-ketosteroids from a previous value of 5·4–7·5 mg. to one of 19·9 mg. on the second day. The increase was maintained into the third day. Two further batches of corticotrophin zinc phosphate were then tried. The second produced an excellent symptomatic improvement for twenty-four hours which continued diminuendo for three days. The output of 17-ketosteroids was increased to 21·8 mg. on the second day and was still increased at the end of three days. The third batch had an identical clinical effect, but the effects on steroid output, though as strong, were slightly less prolonged (table III and fig. 1). The patient has remained very well on a daily dose of 10 units.

TABLE IV—RESULTS IN CASE 4

Date 1953	17-ketosteroid excretion (total neutral fraction) during each 6-hr. period (mg.)				Total excretion per 24 hr. (mg.)
	5 P.M.–11 P.M.	11 P.M.–5 A.M.	5 A.M.–11 A.M.	11 A.M.–5 P.M.	
April 18 ..	..	..	..	5·25	..
„ 19 ..	4·55	3·73	5·00	3·60	16·88
„ 20 ..	3·62	3·40	6·45	5·05	18·52
„ 21 ..	4·80	3·80	5·35	4·44	18·39
Corticotrophin 20 units given at 5 P.M. on April 21					
April 22 ..	5·80	6·75	7·70	4·40	24·65
„ 23 ..	4·06	3·41	5·02	3·23	15·00
Corticotrophin zinc phosphate 20 units given at 5 P.M. on April 23					
April 24 ..	7·10	9·10	6·72	4·65	27·57
„ 25 ..	2·10	2·33	3·80	2·51	10·74
„ 26 ..	1·75	1·53	3·53	..	..

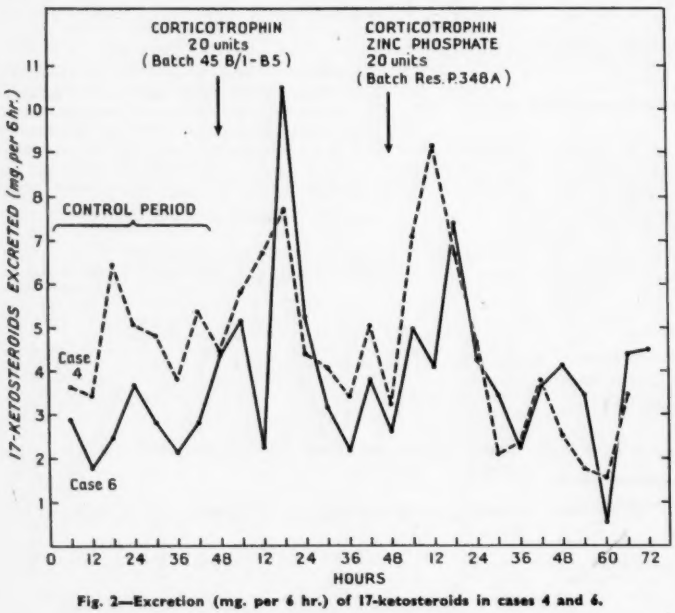

Fig. 2—Excretion (mg. per 6 hr.) of 17-ketosteroids in cases 4 and 6.

Case 4.—A man, aged 52, with rheumatoid arthritis of the hands of only nine months' duration. Hb 100%. E.S.R. 14 mm. in one hour. Corticotrophin 20 units produced good relief of symptoms in the first twenty-four hours. The 17-ketosteroid excretion, which had previously been 16·8–18·5 mg., increased to 24·6 mg. It is difficult to say whether this is significant. Corticotrophin zinc phosphate produced an increase from 15·0 to 27·57 mg. (table IV and fig. 2). In both instances the chemical effects lasted for less than twenty-four hours. Clinically the effects of corticotrophin zinc phosphate lasted about twice as long as those of ordinary corticotrophin. The patient remains free from pain in the hands on a dose of 20 units daily.

Case 5.—A man, aged 65, with Simmonds's disease due to a tumour, probably a chromophobe adenoma of the pituitary, of about fifteen years' duration. Before treatment his output of 17-ketosteroids had been 2·5–2·8 mg. in twenty-four hours. Corticotrophin had no effect on the output, whereas corticotrophin zinc phosphate increased it for more than two days. Two other batches of corticotrophin zinc phosphate were next tried. Both produced results very similar to that of the first batch of corticotrophin zinc phosphate (table V and fig. 1). The clinical results were, of course, difficult to assess.

TABLE V—RESULTS IN CASE 5

Date 1953	17-ketosteroid excretion (total neutral fraction) during each 8-hr. period (mg.)			Total excretion per 24 hr. (mg.)
	2 P.M.–10 P.M.	10 P.M.–6 A.M.	6 A.M.–2 P.M.	
June 20 ..	1·21	0·89	0·78	2·88
„ 21 ..	0·86	0·94	0·70	2·50
Corticotrophin 20 units given at 2 P.M. on June 22				
June 22 ..	1·13	1·19	0·31	2·63
„ 23 ..	0·685	0·965	0·79	2·44
Corticotrophin zinc phosphate batch A 20 units given at 2 P.M. on June 24				
June 24 ..	0·94	1·36	1·68	3·98
„ 25 ..	2·07	1·75	2·18	6·00
„ 26 ..	1·43	1·39	0·98	3·80
„ 28 ..	1·06	0·69	0·72	2·47
Corticotrophin zinc phosphate batch B 20 units given at 2 P.M. on June 29				
June 29 ..	1·11	1·31	1·88	4·30
„ 30 ..	1·76	1·46	2·03	5·25
July 1 ..	1·51	1·30	0·67	3·40
„ 2 ..	0·78	0·95	0·66	2·39
Corticotrophin zinc phosphate batch C 20 units given at 2 P.M. on July 3				
July 3 ..	1·06	1·08	0·98	3·12
„ 4 ..	1·04	1·22	0·94	3·20
„ 5 ..	1·17	1·10	0·88	3·15
„ 6 ..	0·85	0·88	0·99	2·72

Case 6.—A woman, aged 23, with atopic eczema of lifelong duration. Her output of 17-ketosteroids before treatment had been 10·8–10·0 mg. per 24 hr. Corticotrophin produced a dramatic (but unfortunately very transient) improvement in her skin. The 17-ketosteroid output increased to 23·1 mg. but was already almost normal by the evening of the first day. Corticotrophin zinc phosphate produced a similar rise, which persisted for only the same time (table VI and fig. 2). Clinically the effects of each were very transitory even when administration was continued.

Conclusions and Summary

The combination of corticotrophin with zinc phosphate provides an easily injectable preparation whose effects, judged by amelioration of symptoms and by an increase in the urinary excretion of 17-ketosteroids (total neutral fraction), lasts from one to three days (figs. 1 and 2). The immediate symptomatic effects were, in this small series, always as good as, and in all but one instance better than, those of ordinary corticotrophin. The effects were more lasting in 4 cases, but the lack of superiority shown by the zinc preparation in the other 2 cases was due to the surprisingly long activity of the ordinary corticotrophin.

Although the effects in several cases lasted two days or more when the preparation was first tried, in all the cases better clinical results were achieved by daily injections of 10–20 units. The exception was the patient with atopic eczema, in whom only a temporary improvement was obtained. No side-reactions were experienced.

TABLE VI—RESULTS IN CASE 6

Date 1953	17-ketosteroid excretion (total neutral fraction) during each 6-hr. period (mg.)				Total excretion per 24 hr. (mg.)
	6 P.M.–12 P.M.	12 P.M.–6 A.M.	6 A.M.–NOON	NOON–6 P.M.	
April 29 ..	2·88	1·81	2·48	3·68	10·85
„ 30 ..	2·82	2·14	2·79	4·34	12·09
Corticotrophin 20 units given at 6 P.M. on April 30					
May 1 ..	5·15	2·25	10·50	5·23	23·13
„ 2 ..	3·16	2·18	3·80	2·60	11·74
Corticotrophin zinc phosphate 20 units given at 6 P.M. on May 2					
May 3 ..	4·97	4·10	7·40	4·25	20·72
„ 4 ..	3·42	2·23	3·65	4·10	13·40
„ 5 ..	3·45	0·52	4·35	4·45	12·77

We are indebted to Dr. W. J. Tindall, of the Organon Laboratories, for supplies of corticotrophin and of corticotrophin zinc phosphate.

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CORTICOTROPHIN ZINC PHOSPHATE
A LONG-ACTING AQUEOUS PREPARATION

D. G. FERRIMAN, D.M. Oxfd, M.R.C.P., PHYSICIAN
A. B. ANDERSON, Ph.D. Camb., M.R.C.S., F.R.I.C., BIOCHEMIST
NORTH MIDDLESEX HOSPITAL, LONDON
P. P. TURNER, M.D. Lond., M.R.C.P., SENIOR REGISTRAR,
ROYAL NORTHERN HOSPITAL, LONDON

THE chemical and pharmacological properties of corticotrophin zinc phosphate and its comparison with ordinary corticotrophin are described by Homan et al. (1954) and Greene and Vaughan-Morgan (1954). Corticotrophin zinc phosphate is here compared with an ethyl-oleate-beeswax preparation of corticotrophin.

The physical nature of the oily preparation made cleansing of syringes difficult, and the introduction of a trace of water led to coagulation in the contents of the ampoules. The corticotrophin zinc was free from these drawbacks and consequently was distinctly more satisfactory. In addition some patients tolerated subcutaneous injections quite well—a method of administration which is simpler for outpatient use. The necessity for mixture before injection (Homan et al. 1954) was a minor disadvantage.

Clinical Efficacy

The two preparations were standardised by biological tests and, judged by these, were potent. It was desirable to confirm their efficacy in clinical use and to determine whether their clinical effects differed.

Comparison of Ethyl-oleate Preparation with Zinc Preparations

An attempt was made to compare the relative efficacy of the ethyl-oleate and zinc preparations of corticotrophin in seven cases of rheumatoid arthritis and one of ankylosing spondylitis. The cases of rheumatoid arthritis were all active, comparatively severe, and relatively free from osteo-arthritic change; they had failed to respond to adequate periods of rest and physiotherapy and, in some instances, to other forms of treatment. The case of ankylosing spondylitis was active but only moderately severe; bony change was slight. Radiotherapy had given incomplete relief. Response was judged by subsidence of swelling, loss of tenderness on pressure and pain on movement, improvement in mobility, and lowering of erythrocyte-sedimentation rates (E.S.R.).

The ethyl-oleate preparation was given first, in doses of 20 units daily by intramuscular injection. Improvement was assessed weekly, until it was clear that no further improvement could be expected. If good relief was obtained on 20 units, a reduction to 10 units was attempted. If not, the dose was increased to 40 units,

and if necessary to 80 units, until clinical relief was achieved. The minimal effective dose was 20–80 units daily, five of the rheumatoid-arthritis cases requiring 20 units, one 40 units, and one 80 units; the case of ankylosing spondylitis required 40 units. The daily dose having been determined, the interval between doses was lengthened in an attempt to determine the duration of effective action.

Corticotrophin zinc phosphate was next given by intramuscular injection instead of the ethyl-oleate preparation, a daily dose being given equal to the minimal effective dose of the latter. Since this proved effective in all the cases, a lower dosage was next tried. The minimal effective daily dose was the same for the two preparations, there appearing little to choose between them in this respect.

The interval between the doses of corticotrophin zinc phosphate was next lengthened in an attempt to determine the duration of effective action. Here some differences appeared between the two preparations. Ethyl-oleate preparations were never effective for much more than twenty-four hours; indeed in some cases the effect was wearing off before the expiry of this period. The effect of corticotrophin zinc phosphate lasted twenty-four to forty-eight hours, and in two cases it would have been practicable to give injections at intervals of forty-eight hours, but this would have necessitated doubling the dose. All the patients, however, preferred daily doses and were so treated.

Serial E.S.R.s were available in six of the rheumatoid-arthritis cases and the case of ankylosing spondylitis; they became normal in five cases. They remained raised in two of the cases of rheumatoid arthritis, but both had shown good clinical relief and it was considered inadvisable to increase the dose further.

Further Trial

Corticotrophin zinc phosphate was tried in five other cases, and efforts were made to determine the minimal effective dose along similar lines.

A man with rheumatoid arthritis experienced useful but incomplete relief on 40 units daily and his E.S.R. remained somewhat raised; he had developed much obesity and some œdema, and it was not considered advisable to increase the dose any further.

A woman with rheumatoid arthritis experienced much relief on 20 units daily, and her E.S.R. returned to normal. She was very sensitive to corticotrophin, however, the serum-potassium levels becoming dangerously low on this dosage (9·0 and 9·5 mg. per 100 ml.); so it was considered advisable to reduce the dose to 10 units on alternate days, on which dosage clinical relief was not entirely satisfactory.

A man with exfoliative psoriasis, fever, and arthritis responded well; the fever and arthritis disappeared on 20 units daily, and the psoriasis reverted to a chronic form with much scaling; the E.S.R. remained above normal. Reduction of the dosage to 10 units daily led to partial relapse.

A woman with temporal arteritis (confirmed by biopsy) made a good response. Headache and fever disappeared for forty-eight hours after a test dose of 10 units. The patient is now being maintained on 20 units every second day; her clinical condition is satisfactory, but her E.S.R. remains somewhat raised.

A woman with scleredema presented gross thickening and inelasticity of the skin of the neck, trunk, and proximal parts of the limbs, with limitation of neck and arm movement. She was originally treated with an oily preparation of corticotrophin. A remarkable improvement took place, though some thickening and inelasticity remained. Assessment of the minimal effective dose is difficult in this case, but the improvement effected is apparently being maintained on 20 units of corticotrophin zinc phosphate three times a week.

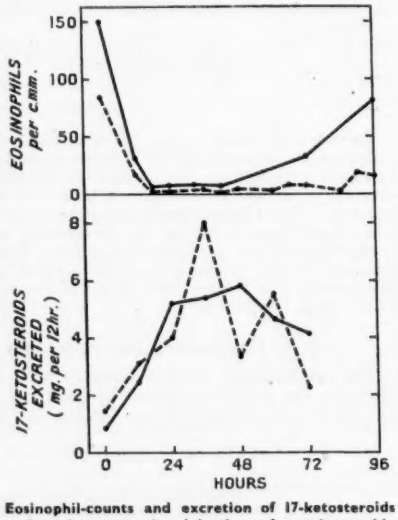
The requirements of these long-acting preparations seem to vary from case to case, and patients need to be stabilised on them in much the same way as diabetic patients on insulin.

Complications

Minor complications—e.g., acne, moon face, pigmentation, and slight obesity—have been fairly common. Œdema and marked obesity developed in one man on 40 units daily. Low serum-potassium levels appeared in one woman on 20 units daily. A woman on 80 units daily developed an extensive gluteal abscess at the site of an injection; this appears to be a recognised complication of continued intramuscular therapy with either corticotrophin or cortisone, the combination of minor introduced sepsis and an altered state of bodily resistance predisposing to such abscesses.

Eosinophils and 17-Ketosteroids

The effect on the eosinophil-counts and on the excretion of 17-ketosteroids of injections of the ethyl-oleate preparation and one of the earlier zinc-phosphate preparations of corticotrophin was studied in four patients, and of the final preparation of corticotrophin zinc phosphate in a further two. The 17-ketosteroids were estimated by the standard method recommended by the Medical Research Council (1951).



Eosinophil-counts and excretion of 17-ketosteroids after intramuscular injection of corticotrophin zinc phosphate 20 units in two patients.

A significant persistent decrease in the number of eosinophils was observed in five of the six patients, being particularly marked after treatment with the final preparation of corticotrophin zinc phosphate (see figure). These responses seemed to be more constant than with quick-acting preparations of corticotrophin.

Increased excretion of 17-ketosteroids also followed treatment with these preparations. This was inconstant with the ethyl-oleate preparation and with the earlier preparation of corticotrophin zinc phosphate, but significant after treatment with the final preparation of corticotrophin zinc phosphate (see figure).

Summary

A preparation of corticotrophin zinc phosphate in aqueous suspension has proved clinically effective and has technical advantages over oily preparations of corticotrophin.

We are indebted to Dr. W. J. Tindall, of the Organon Laboratories, for supplies of the long-acting preparations of corticotrophin. We thank the house-physicians and nurses for their coöperation in the detailed observations required.

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CORTICOTROPHIN ZINC PHOSPHATE
A LONG-ACTING AQUEOUS PREPARATION

S. A. DEN OUDSTEN
M.D. Leiden
HEAD OF DEPARTMENT

L. VAN LEEUWEN — ASSISTANT PHYSICIAN
R. J. COERS — ASSISTANT PHYSICIAN

DEPARTMENT FOR RHEUMATIC DISEASES, ZUIDERZIEKENHUIS, ROTTERDAM

THE disadvantages of frequent intramuscular injections of ordinary corticotrophin, continuous intravenous infusion of ordinary cortieotrophin, and daily injections of the long-acting preparations at present available have been pointed out by Homan et al. (1954), Greene and Vaughan-Morgan (1954), and Ferriman et al. (1954). A new preparation of corticotrophin with zinc phosphate in aqueous solution having become available, it was decided to measure its effect in terms of excretion of 17-ketosteroids and sodium and potassium salts in the urine, and by the decrease in the number of eosinophils in the blood.

It is easiest to count the eosinophils, and by doing so one can estimate the effect of the treatment at various intervals after the injection. The decrease of eosinophils after an injection of 20 I.U. of corticotrophin in aqueous solution reaches its maximum after four to six hours, and usually the original value is regained nine to eleven hours after the injection. Eosinophil-counts also show the duration of the effect of treatment; this is not so easily estimated from determinations of 17-ketosteroids and electrolytes. If a preparation is really long-acting, a prolonged decrease of eosinophils should be obtained.

Eosinophils

We used Zollikofer's (1900) method of counting eosinophils in capillary blood; for this it is essential that the calibration of the pipettes be verified, the staining and mechanical stirring be accurately timed, the same counting-chamber be used, and counting-apparatus be used.

The eosinophil-counts were done in fasting patients at 9 A.M. each day. If the values proved relatively constant during a control period of five to ten days, a curve for one day was made by counting every four hours. If this daily curve showed only minor variations, the patient was given a subcutaneous injection of ordinary corticotrophin, and eosinophil-counts were made at least every four hours. In this way we estimated the duration of the effect. Several preparations of corticotrophin combined with zinc were studied in this way.

MEAN VALUES OF 22 EXPERIMENTS IN 18 PATIENTS AFTER INJECTION OF CORTICOTROPHIN ZINC PHOSPHATE 20 I.U.

Time (hours)	−96	−72	−48	−24	0	4	8	10	14	19	24	28	48
Eosinophils (% of value at zero hour)	96	106	110	96	100	68	20	16	18	40	52	60	92

The accompanying table gives the mean values obtained in 22 observations made on 18 patients injected with identical preparations of corticotrophin zinc phosphate (Homan et al. 1954). The decrease of eosinophils lasts a long time (more than twenty-four hours) compared with the effect of the same quantity of ordinary corticotrophin. From this and other observations we gained the impression that the action of corticotrophin zinc phosphate, reflected in the eosinophil response, sets in as quickly as that of ordinary corticotrophin but does not reach a maximum until about eight hours, against four hours with ordinary corticotrophin (fig. 1). Moreover the subjective improvement, related to time, points in the same direction. Clearly distinguished individual differences, however, will be observed (fig. 2).

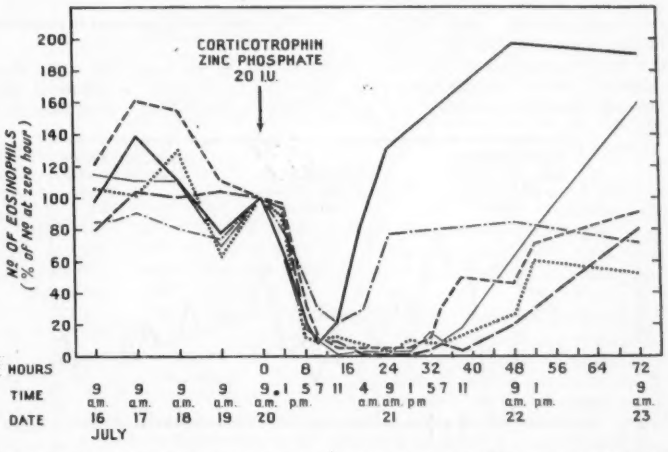

Fig. 2—Eosinophil responses of 6 patients to 20 i.u. of same batch of corticotrophin zinc phosphate given at same time.

Corticotrophin zinc phosphate seems to exert a prolonged action when the decrease of eosinophils is used as a criterion.

17-Ketosteroids and Electrolytes

To determine whether the effect on the excretion of 17-ketosteroids, sodium, and potassium was influenced in the same way, corticotrophin zinc phosphate was next used in more elaborate tests on 2 patients.

Fig. 3 illustrates the effect of the administration of 20 I.U. of corticotrophin zinc phosphate on three successive days, compared with that of six injections of 3·5 I.U. of corticotrophin in aqueous solution on three successive days. The two preparations were made from the same batch of corticotrophin. It is obvious that the depression of eosinophils produced by single injections of corticotrophin zinc phosphate was greater than that produced by an equal amount of ordinary corticotrophin in divided doses.

The excretion of 17-ketosteroids and electrolytes, however, seems to show that the action of corticotrophin

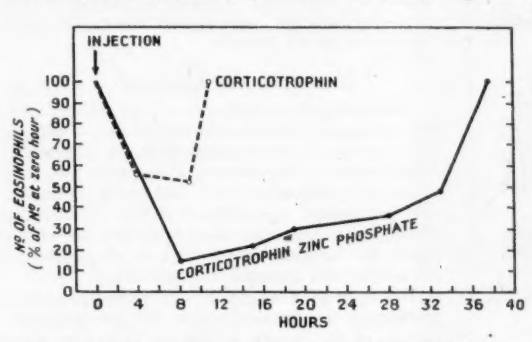

Fig 1—Eosinophil responses to injections of corticotrophin 20 i.u. and corticotrophin zinc phosphate 20 i.u. (mean values in 5 patients treated with same batches).

is increased but not prolonged by the addition of zinc. The protracted decrease of eosinophil-counts might therefore be explained by a very strong initial action. To test this possibility we chose a patient with rheumatoid arthritis whose eosinophil level in the capillary blood had been fairly constant for a long time. We injected four preparations made from the same batch (54/55) of corticotrophin in the following doses: 20 I.U. of corticotrophin, 20 I.U. of corticotrophin zinc phosphate, 80 I.U. of corticotrophin in a single dose, and 80 I.U. of corticotrophin divided into four doses given four-hourly. Fig 4 shows that 80 I.U. of corticotrophin in a single injection depressed the eosinophils more and for a longer time than did 20 I.U. of the same preparation, but not quite so much as, and distinctly for a shorter time than, did 20 I.U. of corticotrophin zinc phosphate. By giving four injections of 20 I.U. of corticotrophin four-hourly a response was obtained which was nearly as good as that of a single injection of 20 I.U. of corticotrophin zinc phosphate.

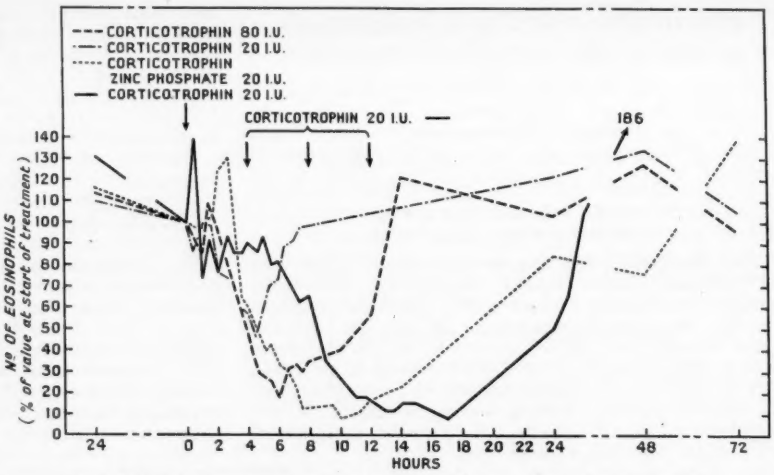

Fig. 4—Eosinophil responses to preparations made from same batch of corticotrophin.

From this experiment we conclude that the action of corticotrophin zinc phosphate is not merely greater, but also lasts longer than that of ordinary corticotrophin. Slow release of the active substance without actual potentiation also produces an increased effect, as was previously shown with a suspension of corticotrophin in cholesterol oil.

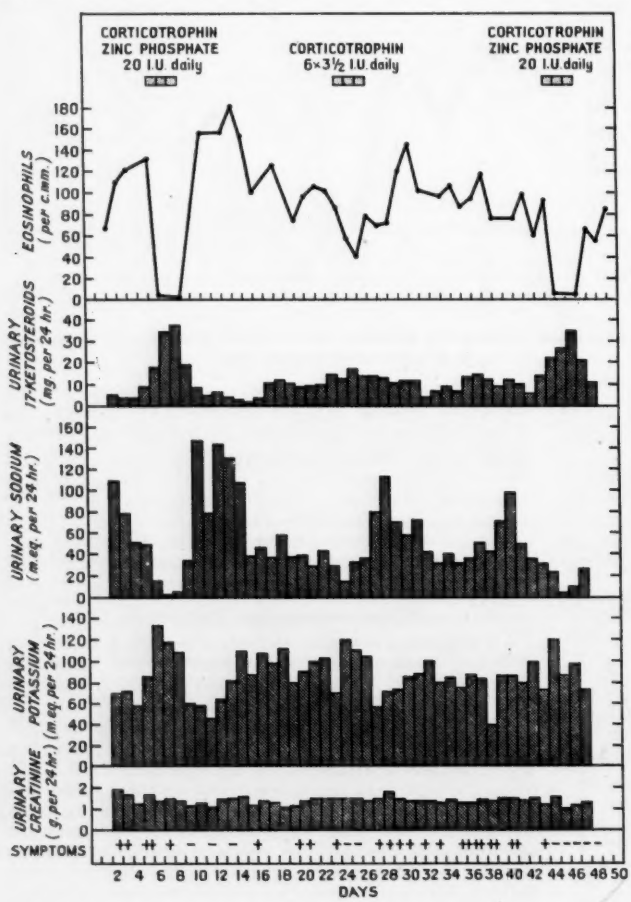
CORTICOTROPHIN ZINC PHOSPHATE 20 I.U. daily
CORTICOTROPHIN 6×3½ I.U. daily
CORTICOTROPHIN ZINC PHOSPHATE 20 I.U. daily
EOSINOPHILS (per c.mm.)
URINARY 17-KETOSTEROIDS (mg per 24 hr.)
URINARY SODIUM (m eq. per 24 hr.)
URINARY POTASSIUM (m eq. per 24 hr.)
URINARY CREATININE (g. per 24 hr.)
SYMPTOMS
DAYS

Fig. 3—Responses of a man with rheumatoid arthritis to corticotrophin and to corticotrophin zinc phosphate. Dummy injections were given daily between treatments.

Treatment

Corticotrophin zinc phosphate was used in 25 patients with rheumatoid arthritis; the therapeutic effect did not differ essentially from the effect obtained by frequent injections of ordinary corticotrophin.

The daily dose given as a single injection never exceeded 20 I.U. of corticotrophin zinc phosphate. In some cases two injections of 20 I.U. a week were sufficient to maintain improvement in rather severe rheumatoid arthritis.

With corticotrophin zinc phosphate we never observed local irritation, allergic reactions, symptoms of resistance to therapy, or other untoward symptoms. Zinc poisoning cannot be expected with the dosage used, and no symptoms attributable to overdose of zinc were observed. 3 patients have received this preparation as maintenance therapy for five to seven months.

Summary and Conclusions

Corticotrophin zinc phosphate stimulates the adrenal gland for twenty-four to forty-eight hours or more after a single injection, as reflected by the eosinophil response and the urinary excretion of 17-ketosteroids, sodium, and potassium. A single injection of 20 I.U. of corticotrophin zinc phosphate has the same effect as four doses of 20 I.U. of ordinary corticotrophin injected four-hourly.

The increased action of corticotrophin zinc phosphate is probably due to the gradual release of the active substance from the zinc complex.

In rheumatoid arthritis corticotrophin zinc

phosphate proved satisfactory in a daily dose of 20 I.U.; in some patients injections twice weekly were sufficient as maintenance therapy. No side-reactions were observed.

We wish to thank Prof. J. Goslings, of the University Clinic, Leiden, for his kind suggestions; Mr. H v. d. Zee, of the Organon-Oss medical service department, who supplied the corticotrophin and made valuable suggestions; Mr. S. H. Wadman, biochemist in charge of the Zuiderziekenhuis laboratory for assistance with the urine analysis; and Mr. A. F. K. Buys Ballot, chief pharmacist of the Bergweg Municipal Hospital, for the determination of 17-ketosteroids in urine.

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A CONVENIENT APPARATUS FOR PROVIDING CONTROLLED HYPOTHERMIA

JAMES MCNAUGHT INGLIS
M.B. Leeds, F.F.A. R.C.S., D.A.
ANÆSTHETIST
W. H. BIFFEN
L.I.B.S.T.
INSTRUMENT CURATOR
A. L. D'ABREU
O.B.E., Ch.M. Birm., F.R.C.S.
THORACIC SURGEON
UNITED BIRMINGHAM HOSPITALS

CAREFULLY controlled lowering of body-temperature during anæsthesia reduces the consumption of oxygen by the tissues. The most convincing and dramatic application of this principle in cardiac surgery has come from Swan and his colleagues in Denver (Swan et al. 1953). Churchill-Davidson et al. (1953) and Dundee et al. (1953) have shown that patients require less oxygen at reduced body-temperature, and the conclusion from these observations is that, whatever its value in general surgery, this technique should find an assured position in surgery of the heart.

Our own clinical experience is confined to seven children with congenital heart lesions, treated surgically after being cooled by the surface method.

Cooling by the surface application of cold has been preferred to the method of Delorme (1952), whereby part of the peripheral circulation is exteriorised and its contained blood cooled directly and then returned to the body. Our preference for the surface method is based on two principles: (1) any technique used to facilitate surgical operations should be as simple as possible: and (2) since our patients are ill children, actual operative procedures should be kept to a minimum.

We have no experience of the "lytic "cocktail" (Laborit et al. 1952) and have not used any drugs or ganglion-blocking agents other than those necessary to produce anæsthesia and to prevent shivering.

In using hypothermia in seven children, aged from 4 months to 13 years, we have found that patients of this age-group cool readily and safely when exposed to reduced temperatures; further, when heat is applied, they rewarm to normal body-temperature at about the same rate as they cool.

Churchill-Davidson et al. (1953) state that when the body-temperature of dogs is reduced below 24°C, various cardiac irregularities and arrhythmias tend to arise. We have not seen such changes in children cooled to 24·5°C, but the possibility of fatal ventricular fibrillation has led us to seek a method of inducing reduced body-temperature which is readily controllable. There must be accurate regulation of rate and degree of cooling, and it should be possible to institute rewarming immediately it is considered necessary.

Method

The simplest method of cooling is to apply ice-packs to the skin of the patient; but, considered as part of the general operative management, this method is obviously hard to control. To expose the skin to a temperature of 0°C without facilities for immediate rewarming, especially if the indication for the termination of the hypothermia should arise during the operation, is difficult to justify in human patients. Complete control of the refrigeration should be maintained at all times. This communication is a description of an apparatus which has been designed for this purpose.

The principle of the apparatus is that it provides controlled cooling of a patient through the medium of an enveloping blanket. This blanket is of the type used by Bigelow et al. (1950) in their experiments on animals, but we have yet to decide on the ideal specification. Basically it resembles an electric blanket with continuous rubber or plastic tubing substituted for the electrical heating element (fig. 1).

The hypothermia unit which operates this blanket is illustrated in figs. 1 and 2. It has a central reservoir tank which contains cooling coils and immersion heaters. This tank is filled with a mixture of ethylene glycol and water, the temperature of which can be varied from −22°C to 65°C.

From this tank the mixture is circulated by a pump through the tubing of the blanket and then returned to the reservoir. In this way a continuous circulation is maintained. The amount of fluid which passes through the blanket can be varied or cut off altogether if desired; thus the blanket circulation can be discontinued while the temperature of the tank is altered; or, if desired, the temperature of the tank can be increased or decreased while the fluid is circulating through the blanket. By this latter method immediate rewarming can be started at the turn of a switch.

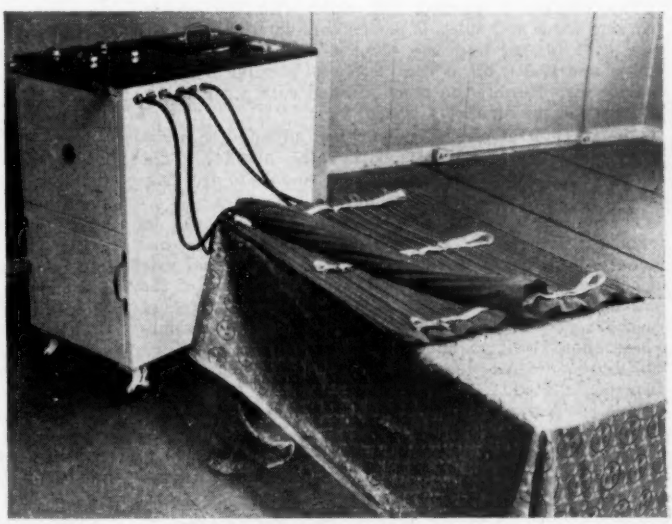

Fig. 1—The unit connected to two blankets.

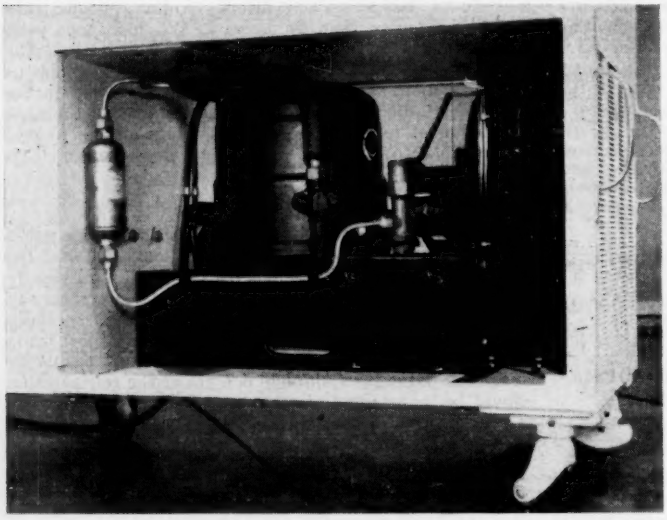

Fig. 2—The standard 'Prestcold' refrigeration compressor which is fitted into the unit.

Technique of Application

The blanket is first connected to the unit, and the refrigerator is brought into operation. The blanket is folded upon itself so that an air-space is enclosed, and the ends are sealed off. The blanket now encloses a lumen the temperature of which can be reduced to freezing-point or lower. Our practice is to produce within this space a temperature of about 5°C; this takes less than thirty minutes.

The child is then anæsthetised. The administration of rectal thiopentone followed by nitrous oxide and oxygen with small doses of pethidine has been found to be the most useful technique. The trachea is intubated in a gas-tight manner, with a cuffed tube if necessary, and complete curarisation is produced with *d*-tubocurarine. Complete curarisation is helpful for two reasons: (1) it enables the anæsthetist to take control of the respiration; and (2) it prevents shivering. Rectal or œsophageal thermocouple leads and electrocardiograph leads are then connected. An intravenous drip is set up, and the child is then ready for cooling.

The blanket is opened, the child with the accompanying wires and tubes is placed completely within the now cold lumen, and the blanket is then once more closed and sealed off as completely as possible from the outside air. Respiration is maintained with a breathing-bag outside the blanket.

The thermostat on the unit is then adjusted to maintain a temperature of 5°C within the blanket. The temperature should not be allowed to fall to freezing-point, for this might lead to trophic skin changes.

The child's body-temperature and heart-rate will be found to fall steadily. The rate of fall is slow at first but increases sharply once cooling begins. The actual rate of cooling by this method will vary with the size of the patient, the temperature gradient, and the degree of vasoconstriction, but for a 2-year-old child it is somewhere about 10°C an hour. Further doses of pethidine and *d*-tubocurarine are administered via the intravenous drip as required. In practice it has been found that cooling the patient reduces the need for these agents very considerably.

When the desired body-temperature has been reached, the blanket is opened and the operation is done with the child still lying upon the blanket and with the flow through the tubes of the blanket still maintained. If desired, sectional blankets can be used so that only part of the body is uncovered, but in our experience this is unnecessary in the case of children.

Rewarming can be begun at any time, whether the operation is still in progress or not. It is only necessary to set the thermostat on the unit to a higher figure for the heaters to come into operation. In the normal course of events the blanket circulation can be turned off, and the temperature of the tank raised to 45°C in readiness for rewarming, as soon as the operation has been started. Thermostatic control of the temperature of the blanket is maintained during rewarming, and when the surgeon has completed the operation the child can once again be completely enclosed.

We are indebted to the Prestcold division of the Pressed Steel Company, Cowley, England, for their help in designing the unit and for building it for us. This study was made with the aid of a grant from the United Birmingham Hospitals Endowment Fund.

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THORN'S SYNDROME FOLLOWING EXCESSIVE INGESTION OF ALKALIS

A. I. CHEYNE, M.D. Aberd.
CONSULTANT PHYSICIAN
T. P. WHITEHEAD, F.R.I.C.
BIOCHEMIST
SOUTH WARWICKSHIRE HOSPITAL GROUP

SALT-LOSING nephritis was first described by Thorn et al. (1944), who used this term for convenience and because of its therapeutic implications in describing renal disease with the symptoms of salt deficiency. Biochemical investigation showed that patients with this condition had normal adrenal function but had a defect in the renal tubules, and the kidney could not reabsorb salt in response to the administration of deoxycortone acetate. In a review of the published post-mortem findings in this condition Enticknap (1952) has suggested that the term "salt-losing nephritis" is unsatisfactory and should be superseded by "Thorn's syndrome." We have followed his suggestion.

Eight further cases have been published (de la Balze and Oñativia 1947, Borst 1950, Sawyer and Solez 1949, Rosenheim 1951, Nussbaum et al. 1952, Joiner and Thorne 1952). Joiner and Thorne (1952) have summarised the clinical findings in all these cases. The patients are usually young adults and present with any or all of the symptoms of Addison's disease. There is sometimes a history of nocturia but otherwise no history of renal disease. Pigmentation of the skin has been noted in four cases. Casts and cells are almost always absent from the urine. Adrenal-function tests are normal, and renal-function tests show advanced renal insufficiency. The patients respond to treatment by replacement of the lost sodium chloride.

Two of the ten published cases have certain distinctive features: a woman aged 53 (Sawyer and Solez 1949) and a man aged 49 (Rosenheim 1951) were well above the average age of the other patients and had both been taking excessive quantities of alkalis for a long time to relieve the pain of duodenal ulcer.

We report here a third case of Thorn's syndrome in a patient who had been taking large amounts of alkaline powders for more than 20 years to obtain relief from the pain of a duodenal ulcer.

Case-report

A married man, aged 49, was admitted as an emergency on Sept. 19, 1952, with a clinical history of duodenal ulcer which dated back for over 20 years, and throughout that time he had been taking alkaline powders in increasing quantities; during the last few years he had taken an average of eight large teaspoonfuls a day. There was no history of hæmatemesis or of melæna, but for 3 weeks before admission the pain had been continuous and the vomiting intractable. There was no history of renal disease.

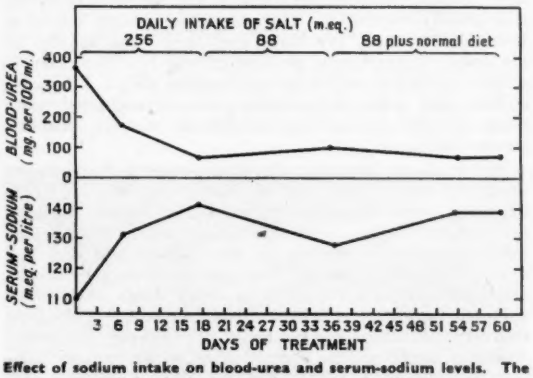
On admission he was thin but not wasted; he was obviously dehydrated, and had a dry furred tongue. In addition he had conjunctivitis, carious teeth, and infected gums. The mucosæ were not pigmented. His skin had a peculiar colour perhaps best described as half-way between the bronzing of Addison's disease and the lemon-yellow of addisonian anæmia. Tenderness was elicited in the epigastrium. Clinical and radiological examination showed no abnormalities in the respiratory and cardiovascular systems. Examinations of the central nervous system and fundi were negative. The blood-pressure was 135/75 mm. Hg. For the first few days he was treated as a case of peptic ulcer, and the vomiting soon ceased. During this period the following investigations were made.

Investigations

Repeated examination of the urine showed a trace of protein, a few red cells, and an occasional polymorph, but no casts or organisms. A 24-hour specimen of urine contained 1·4 g. (61 m.eq.) of sodium. The urinary excretion of 17-ketosteroids was 11·8 mg. daily. Examination of the blood showed Hb 8·9 g. per 100 ml., white cells 13,000 per c.mm. (differential count normal), erythrocyte-sedimentation rate 95 mm. in 1 hour (Westergren), blood-urea 370 mg. per 100 ml., serum-sodium 109 m.eq. per litre, serum-chloride 73·5 m.eq. per litre, serum-potassium 4·3 m.eq. per litre, plasma-alkali reserve 30·6 m.eq. per litre, and serum total protein 8·1 g. per 100 ml. (albumin/globulin ratio normal). Thorne's eosinophil-depression test showed normal adrenal function.

Treatment and Progress (see figure and table)

In view of the low serum-sodium level and the excretion of appreciable quantities of sodium in the urine, oral sodium chloride was given up to the maximum the patient could tolerate—i.e., 15 g. (256 m.eq. of sodium) per day. The patient's condition definitely improved, and blood analysis on the 7th day of treatment showed that the blood-urea level had fallen to 175 mg. per 100 ml. and the serum-sodium level had risen to 132 m.eq. per litre. Although the oral intake of sodium was 256 m.eq. per day, the urinary excretion of sodium during this week averaged only 88 m.eq. per day. By the 17th day of this high salt intake the blood-urea level was 75 mg. per 100 ml., the serum-sodium level was 141 m.eq. per litre, and the urinary excretion of sodium averaged 195 m.eq. per day.



Effect of sodium intake on blood-urea and serum-sodium levels. The salt intake is expressed as m.eq. of sodium.

DIETARY INTAKE AND URINARY EXCRETION OF SODIUM

Dietary intake of sodium (m.eq. per day)	Period (days)	Average urinary excretion of sodium (m.eq. per day)
Gastric diet (normal salt)	3	62
256	17	1st–6th day, 88 11th–17th day, 197
88	17	113
88 Plus 10 mg. of deoxycortone acetate a day	3	118

At this time Van Slyke's urea-clearance test showed a clearance 20% of normal. An intravenous pyelogram on two occasions showed failure of the kidneys to concentrate the dye, and therefore the renal tracts were not outlined; dye was noted in the bladder 50 min. later.

The dietary sodium intake was reduced to 88 m.eq. per day for an experimental period of 17 days. There was little clinical change, but the serum-sodium level fell to 128 m.eq. per litre, and the blood-urea level rose to 100 mg. per 100 ml. During this period the urinary sodium (113 m.eq. per day) was more than the dietary intake. While still having a dietary sodium intake of 88 m.eq. per day the patient was given 10 mg. of deoxycortone acetate per day for three days. There was no decrease in urinary sodium, the average daily excretion over the three days being 118 m.eq. per day.

The patient was now given 5 g. of salt (88 m.eq. of sodium) per day in addition to his normal diet. He was discharged on this régime on Nov. 26, 1952.

For 15 months his blood-urea level has been maintained at about 70 mg. per 100 ml., and his serum-sodium level has remained within the normal range. He has been able to carry out the duties of a foreman maintenance engineer during this time.

Discussion

This patient presented in a uræmic state with no previous history of renal disease. Although renal insufficiency was present, his poor condition on admission was mainly the result of salt deficiency. When this was relieved by a high oral intake of salt, his condition was considerably improved. This coincided with a fall in the blood-urea and a rise in serum-sodium. When dietary salt was restricted to 5 g. of salt (88 m.eq. of sodium) per day, the urinary sodium alone was more than the intake and there was a fall in serum-sodium and an increase in blood-urea. Thus the patient had "salt-losing kidneys." Large doses of deoxycortone acetate did not affect the urinary sodium; the patient was completely unresponsive to this drug, and this characterised his condition as being that of Thorn's syndrome.

Eleven cases of Thorn's syndrome have been published including this one. Of these eleven cases three have occurred in later life after excessive consumption of alkalis for the relief of pain from a duodenal ulcer. Sawyer and Solez (1949) and Rosenheim (1951) associated the renal lesion in their cases with prolonged alkali therapy, and we feel that the case presented here is additional evidence that a salt-losing renal lesion can be produced in this way. The lesion in our case is probably not as severe as in other reported cases: the acid-base regulating mechanism of the kidney appears to be unaffected, the patient having a normal alkali reserve; and he has remained comparatively well on a normal diet with a 5-g. salt supplement. The diffuse tanning of the skin was present in all three cases which followed alkali therapy.

Though only a few cases of Thorn's syndrome are on record, the incidence of those with a history of excessive alkali therapy is high, and such therapy must be considered one of the possible causes of this interesting tubular defect.

The ingestion of alkalis causing the urine to be of high pH may over several years produce calcification in the kidneys leading to impaired tubular functions. At necropsy the case described by Sawyer and Solez (1949) had extensive calcification of the kidneys, but in addition the patient had a pyelonephritis, which is the most usual necropsy finding in Thorn's syndrome.

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Medical Societies

ROYAL SOCIETY OF MEDICINE

Nutrition of the Surgical Patient

ON March 3 the section of surgery met to discuss the Nutrition of the Surgical Patient. Sir HENEAGE OGILVIE, president of the section, said that the great advances of the last few years could certainly have been made by surgeons as technically skilful as Moynihan and many others in the past if they had also possessed the biochemical knowledge which was being made available by the younger men today.

Mr. L. P. LEQUESNE said that the commonest nutritional problem in surgery was the patient with organic disease of the alimentary tract whose deficiencies could not be made good orally before operation. Speaking particularly of the fluid and electrolyte requirements of these patients, he emphasised that not all deficiencies were immediately apparent and that it might be difficult to assess their size. He underlined the importance of sodium in governing the tonicity of body-fluids and the partition of water between the intracellular and extracellular compartment. In salt deficiency the extravascular compartment of the extracellular space contracted at first; later the plasma volume fell, leading to postural hypotension and peripheral circulatory failure, associated with rising plasma-protein concentration and hæmoglobin. The urine was of low specific gravity; the chloride was low and might be absent. The absence of thirst, the dryness and inelasticity of the skin, and the tendency to low blood-pressure and circulatory collapse were emphasised. In pure water depletion the volume of the extracellular fluid was maintained at the expense of the intracellular water. Thirst was severe, and the urine showed a high specific gravity and chloride concentration. In investigating a case of salt and water deficiency (which rarely occurred separately), it was usually only necessary to estimate the urinary specific gravity and chloride concentration, the hæmoglobin or plasma-proteins, and blood-urea. The blood-urea was raised by either deficiency. Normal concentrations of plasma electrolytes could accompany severe depletion. With moderately severe clinical signs the deficit of extracellular fluid volume might be 3–4 litres in acute cases. Every case must be regarded as a therapeutic experiment, and the effects of treatment checked every 12–24 hours. Replenishment was complete when clinical signs had disappeared, when the blood-urea, plasma-protein, and electrolytes were normal, and when the urine volume exceeded 1 litre in 24 hours with normal specific gravity and chloride concentration. Anæmia, initially masked by hæmoconcentration, might then become apparent, and transfusion might be necessary. Solutions to correct acid-base disturbances were seldom needed. Potassium, however, might be required, particularly postoperatively. Electrocardiography gave a useful indication of this need, which might be 200–300 m.eq. or more. If it had to be given intravenously, the rate should not exceed 20 m.eq. per hour (1·5 g. potassium chloride). Solutions more concentrated than 40 m.eq. per litre might be painful.

After operations a complex metabolic disturbance, mainly due to increased secretion of adrenocortical and antidiuretic hormones, resulted in increased urinary loss of nitrogen and potassium and depression of the renal excretion of salt and water. Oliguria with a high urinary specific gravity usually lasted 30 hours after operation, but salt excretion might be reduced for 5–6 days. In Mr. LeQuesne's opinion it was wise not to give more than 2 litres of water per 24 hours for the first 24–48 hours after operation, but to give 3 litres thereafter. One bottle of saline (4·5 g. salt) should be given every 24 hours, and the amount increased only if abnormal losses occurred. He added 6 g. potassium chloride to the 24-hour intake after the first 36 hours. It was important not to mistake the high urinary specific gravity occurring for 24–48 hours after operation and the low urinary chloride concentration in the 2nd–5th days for necessary indications for further increasing the salt and water intake.

Dr. W. H. H. MERIVALE spoke particularly of alterations in acid-base balance and of potassium deficiency seen in surgical patients. Loss of gastro-intestinal secretions was the commonest cause. He gave figures taken from a case in which there had been prolonged loss of bile and pancreatic fluid from a fistula, which was replaced with sodium chloride alone. The plasma-bicarbonate was eventually found to be 5·6 m.eq. per litre, which would theoretically require 4200 ml. of one-sixth molar sodium lactate solution for its correction. In the first 48 hours the patient received 582 m.eq. (3·5 litres) of sodium lactate, but lost 383. Correction was not achieved for a further 48 hours. Replacement by sodium chloride would have produced an even more severe disturbance if the fluid draining, being partly bile, had not contained a moderate chloride concentration. Hypochloræmic alkalosis was not always seen in patients with gastric carcinoma who were dehydrated after prolonged vomiting. In his opinion this might be because gastric secretion was depressed by nausea and its acidity was not high and might be partly neutralised by mucus. When it did occur such an alkalosis could only be partly corrected by sodium chloride alone, and potassium depletion must also be made good. He gave illustrations to show the poor renal conservation of potassium in deficiency. This urinary loss might be increased by massive infusions of sodium, which displaced intracellular potassium. Potassium depletion might lead to paralytic ileus, though this was not invariable, and was often due to other causes. He believed that the clinical signs—namely, the death-like appearance, muscular weakness, and pain in the legs—were important in diagnosis, whereas the value of the electrocardiogram was greatly overrated. The plasma-potassium might be less than 3 m.eq. per litre, and there was usually an alkalosis. Intravenous potassium was not necessary in patients likely to return to oral feeding within 4–5 days; sodium and water deficiencies must be corrected first; either a high blood-urea or oliguria was an absolute contra-indication.

Mr. R. H. F. BRAIN spoke of the need to build up an adequate nutritional reserve before operation. Malnutrition might be seen not only in malignant disease, obstruction of the upper alimentary tract, and chronic infection but with chronic anoxia. Moore and Ball had shown that the katabolic response to surgery in undernourished patients might be a small one: this "predepleted response" might itself be one cause of delayed recovery. A calorie reserve could not be built up easily; glycogen could not be stored in amounts greater than that required by the body for 24 hours. Fat alone pro-

vided a store of calories, and fat patients for this reason were not always such poor surgical risks as they were supposed to be. Many cases of carcinoma of the upper intestinal tract had been found to have impaired fat absorption, which might be associated with negative calcium balance. Whenever possible he gave double the patient's theoretical calorie requirement, based on the ideal weights, with four times the basic requirement of protein. Vitamins B and C were particularly necessary. Recently a case of carcinoma of the œsophagus had first presented at medical outpatients at Guy's Hospital as a case of frank scurvy. After a period of adequate feeding the appetite itself often increased, which was a favourable sign of improvement. For each pound of tissue stored in response to adequate nutrition, 16 g. of nitrogen would be available for the katabolic phase, so that at least 7 lb. of rebuilt tissue was a desirable aim for preoperative preparation of the undernourished patient.

Miss ANNE SUTHERLAND said that every case must be treated on its merits. This was particularly true of patients suffering from burns or trauma. The most difficult ones were those needing multiple anæsthetics at operation, for normal feeding was then repeatedly interrupted. Adequate treatment could reduce the nitrogen loss and the duration of the negative balance; though the negative balance could not be eliminated at least it should not be prolonged by starvation. If the intake of calories was deficient, protein was metabolised to provide energy. The high-protein, high-calorie diets ordered in the ward did not always provide the extra intake they were supposed to, and many patients for whom they were ordered were found on inquiry to be eating far less than they should. In Edinburgh, they had devised special high-calorie dietary supplements, and Dr. Sutherland gave some examples of the improvement that these might produce.

New Inventions

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FOR arteriography in the limb the set described here has been found superior to simple combinations of syringe, needle, and rubber tubing for injecting the contrast medium.

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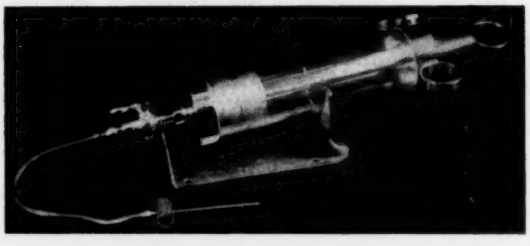
With the tap open and a syringe containing saline solution in position, the back flow of blood in the translucent tubing when the artery is entered is under direct observation, and this facilitates the correct adjustment of the needle in the arterial lumen. If a piece of rubber tubing has first been mounted on the needle, as in the illustration, a piece of strapping applied across the rubber tubing, which itself is made to rest on the skin, securely anchors the needle to the skin; the flexibility of the plastic tube prevents any subsequent disturbance of the needle during manipulations of the syringes. Occasional small injections of saline solution will maintain the patency of the needle, the tap being kept shut except during injections. Contrast medium is injected when desired after substituting a syringe containing the medium for that containing saline solution, and a further injection can readily be made if inspection of the first films shows it to be necessary. 20 ml. of 50% diodone can be delivered in seven seconds or less.



The set was made by Talley Anæsthetic Equipment Ltd., New Cavendish Street, London, W.1.

University College Hospital, London

C. J. LONGLAND
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Reviews of Books

Textbook of Gynecology

JOHN I. BREWER, M.D., PH.D., professor of obstetrics and gynecology, Northwestern University Medical School, Chicago. Baltimore: Williams & Wilkins. London: Baillière, Tindall, & Cox. 1953. Pp. 532. 76*s*. 6*d*.

THE subject matter of this book is arranged in an original manner which has much to commend it. On the basis that knowledge and understanding of pathology should precede any attempt to master symptoms, signs, diagnosis, and treatment, the first part—some 200 pages—is concerned entirely with this aspect of gynæcology. This first section provides exactly what the student needs. It is a full, accurate, and interesting account of the various disorders and diseases which affect the female reproductive organs. The whole is beautifully illustrated with photographs of the actual lesions or of their microscopic appearance. The last 300 pages are concerned with the various symptoms of a possible, or impossible, gynæcological disorder. The author here displays his extensive knowledge and shows a great understanding of his patients. He helps the reader to realise the vital importance of the general mental, physical, and social background. The book contains only the indications for treatment and no operative details whatever, and in several ways it is an ideal textbook of gynæcology for the student.

Nature and Structure of Collagen

Editor: J. T. RANDALL, F.R.S., honorary director, Medical Research Council Biophysics Research Unit. Assisted by SYLVIA FITTON JACKSON. London: Butterworth. New York: Academic Press. 1953. Pp 269. 42*s*.

IN March, 1953, the Faraday Society held a conference—probably the first in the United Kingdom—on connective-tissue research, and the proceedings show that the venture was well worth while.

Much of the value of such a symposium lies in the mingling of different approaches to the subject, and those who are preoccupied with collagen as a component of diseased connective tissue will gain perspective from this book. More than half of it deals with the physico-chemical properties and structure of collagen and its derivatives, as revealed by specialised techniques—e.g., X-ray diffraction studies, electron microscopy, electrophoresis, and chromatographic analysis. These and other studies reported here from such seemingly diverse sources as textile and leather research, biophysics, and histopathology, as well as those from the rheumatism research centres, have established striking and, one may hope, significant facts about collagen.

The growing volume of contemporary research in connective-tissue diseases and rheumatism springs in part from the wish to explain therapeutic results, yet work in this direction remains inchoate. On the other hand, this absorbing and well-produced book is encouraging evidence of progress in basic analytical research into the nature of connective tissue.

Good Living

A Philosophy of Health. A. T. TODD, M.B., M.R.C.P., consultant physician, Bristol Royal Infirmary. Bristol: John Wright & Sons. Pp. 224. 21*s*.

THIS is a book of instruction for the layman on the author's principles of keeping fit. He defines good living as "living happily or healthily": the word "or" is noteworthy. He has many forthright ideas that will not be generally acceptable.

He classes as dangerous foods milk and all milk products and foods containing milk (except Nestlé's sweetened milk), cheese, butter, and eggs. Foods difficult to digest and also banned include veal, nuts, chocolate, and tinned pineapple. The "really beneficial foods" are various fruits and vegetables, jam, and honey. Much of his advice is good; but much is not very practical, "As an example of the ills of lack of exercise the case of the late G. B. Shaw is most instructive." As Shaw attained more and more years he took less and less exercise, and when his bones were sufficiently atrophied he tripped over a carpet and fractured his femur. Dr. Todd thinks that Shaw should have made a habit of walking round the house in stockinged feet on tiptoe to strengthen his feet, and should have done exercises such as "ballet dancing," consisting in a deep breath in and out, taking two paces forwards and kicking the right leg up until with practice the foot rises at least to the level of the eyes; then three paces back and another deep breath and the whole repeated with the other leg. One cannot but regret the lack of G.B.S.'s comments on this advice.

Elderly people are forbidden fats, milk, eggs, cheese, soup, and smoking, and their leisure and rest are severely restricted. The question arises whether it is worth carrying out during youth all the instructions necessary for good living if so many of the comforts of old age are denied. But then the author fairly gives the choice between living happily *or* healthily.

Salmonellæ and Shigellæ

Diagnosis Correlated with Clinical Manifestations and Epidemiology. ALFRED J. WEIL, M.D., department of bacteriology, Bronx Hospital, New York; IVAN SAPHRA, M.D., department of bacteriology, Beth Israel Hospital, New York. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1953. Pp. 247. 56*s*.

IT is evident that Dr. Weil and Dr. Saphra are both working at the bench; so their descriptions of laboratory technique, and their explanations of results and the methods of approach to technical problems are useful. But it is surprising that they should have allowed so many inaccuracies to appear in their book. For example, the biochemical reactions of such well-known organisms as the Manchester bacillus and *Salmonella pullorum* are wrongly given; a coloured diagram is at variance with its explanatory chart; and there are misquotations of the work of others. The description of clinical manifestations and the section on epidemiology are disappointing, and the meaning of some parts of the book is not very clear. The method of reference in the text makes it impossible, in some instances, to correlate with the list of references. The electron micrographs are beautiful, but many of the diagrams fail to assist in the understanding of the text. Thus the book needs careful revision before it can be recommended.

Man's Back

THEODORE A. WILLIS, M.D., F.A.C.S., consulting orthopædic surgeon, U.S.P.H.S. Hospital, Cleveland, Ohio. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1953. Pp. 161. 70*s*.

IN his preface Dr. Willis admits that he "has enjoyed expressing personal opinions based upon his own experience," and this book is very much a personal monograph. It has all the strength and weaknesses of its kind, but the style is easy and it is full of ripe wisdom.

The anatomy and embryology is simply described and there is an excellent short chapter on vertebral anomalies and defects of development. Another on psychoneuroses and malingering is also valuable; "backache . . . is, second to headache, probably the most common evidence of emotional and psychic disturbance." The chapters on injuries and diseases of the back are the least satisfying. Some of the surprising omissions and the lack of clarity in the indications for the forms of treatment suggested are perhaps due to over-compression. Only five pages are given to intervertebral disc lesions, and the conservative treatment of the proplapsed disc is dismissed briefly with the recommendation to rest the patient with the spine *flexed*: there is no mention of the use of traction or a plaster jacket. There is little discussion of the visceral causes of the backache. Gynæcological troubles, so often a puzzling factor in the differential diagnosis, are also ignored. Dr. Willis wisely groups together the forms of nonspecific infective spondylitis, which he labels "rheumatoid" and for which he recommends Warren Crowe's vaccines. Tuberculosis of the spine is allotted only half a dozen pages, and the account of fractures of the spine is correspondingly brief.

But the descriptions so far as they go, are excellent, and Dr. Willis is to be congratulated on his succinct writing. The book is well produced in large clear print, and the illustrations, with a few exceptions, are excellent.

Klinik der Nebenniereninsuffizienz und ihre Grundlagen

Prof. Dr. LUDWIG WEISSBECKER. Medizinische Universitäts-Klinik Freiburg Br./Stuttgart: Enke. 1954. Pp. 251. DM. 31.

THIS book, dealing with various forms of adrenal insufficiency, was written for the clinician by a pupil of Ludwig Heilmeyer. After a comprehensive survey of the physiology of adrenals, the hormones and metabolic relationships, he discusses Addison's disease in great detail and reviews critically laboratory findings, diagnostic tests, and therapy. The Waterhouse-Friderichsen syndrome is well described, but the adrenocortical failure in congenital hyperplasia is mentioned only in one sentence. The chapter on relative adrenocortical failure and the so-called exhaustion of the cortex is particularly valuable because of its justified criticism. There are 854 references, which are up to date, and very few errors. This monograph will be a welcome addition to Soffer's *Diseases of the Adrenals*, which has a wider scope. The few black-and-white illustrations are good, but the colour plate has an unnatural greenish tinge, and is inferior to that in Soffer's book.

Vitamins in Medicine (3rd ed. London: Heinemann Medical Books. 1953. Pp. 784. 70*s*.).—So much has been learnt since the second edition of this book appeared in 1946 that Dr. Franklin Bicknell and Dr. Frederick Prescott have had to rewrite most of their text. But it remains as comprehensive as it was; it is even better illustrated; and its 4500 references have been swelled by another 1000. All this has been done with very little increase in size. Having gathered the new harvest from this difficult and extending field, the authors thresh out its implications and weigh their conclusions. The reader has reason to be grateful for their work.

Stedman's Medical Dictionary (18th ed., London: Baillière, Tindall, & Cox. 1954. Pp. 1561. 63*s*.).—In their preface to this new and larger edition, Dr. N. B. Taylor and Mr. A. E. Taylor, while welcoming new words as a sign of progress, protest against "etymological miscegenation" and suggest that an academy of classical scholars and medical men should be formed to approve or disapprove proposed new words and even to suggest them. Although the present edition has 200 more pages than the 17th and contains several thousand more words and nearly 600 new illustrations, it is 2*s*. cheaper.

Practical Orthoptics in the Treatment of Squint (4th ed. London: H. K. Lewis. 1953. Pp. 371. 63*s*.).—The position of orthoptics has gradually changed over recent years; and though in this new edition of "Lyle and Jackson," Mr. T. Keith Lyle, now assisted by Mrs. Marianne Walker, is dealing primarily with its therapeutic uses, he gives more weight than formerly to its diagnostic value. In an introductory chapter, he sets out fairly the scope and limitations of the method, and he has considerably enlarged the chapter on the examination of cases. The chapter on orthoptic instruments has been brought up to date, and there are new chapters on ocular neurosis and nystagmus. The book is clearly written and well produced.

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THE LANCET
LONDON: SATURDAY, MARCH 13, 1954

Full-time—Part-time

OF some 6250 consultants working in the National Health Service in England and Wales, nearly 1800 have whole-time contracts. The proportion of whole-timers varies in different regions and still more in different specialties: in psychiatry, tuberculosis, radiology, pathology, and pædiatrics, for example, the proportion is higher than in general medicine and surgery. The proportion of consultant work which is done by whole-timers is of course considerably larger than these figures indicate, as would be shown by a statement of the number of sessions undertaken; but unfortunately this information has not been published, and estimates are likely to be misleading unless the totals are broken down under different specialties. The overall estimate of 70% quoted by Dr. STARK MURRAY [1] for the South West Metropolitan region may well be excessive, in view of the high proportion of mental hospitals in that region. But obviously a great deal of the work of general hospitals is done by whole-timers.

There are strong arguments for having both full-time and part-time consultants in the hospitals and clinics. In the past, the number of consultants in a locality depended chiefly on the amount of private practice, and the lesser specialties and less popular areas suffered correspondingly. Under the N.H.S. a better distribution of consultant cover has been achieved by appointing additional consultants, of whom many are working full-time—i.e., without any support from private practice. Apart from this practical reason for offering a whole-time contract, we have to recognise that some consultants do their best work when relieved of the distractions of private practice: rather than undertake private work many of them prefer to give time and energy to reorganising and developing the medical services, or to research. But the fact that there are good reasons for offering whole-time salaries does not mean that all consultants in the N.H.S. should do no medical work outside its confines. It would, of course, be feasible—and some think more economical—to build up an entirely whole-time consultant service; but there are cogent reasons against doing so, which are brought out by the memorandum of the Royal College of Physicians to the Guillebaud Committee, which we publish on p. 562. Experience of full-time practice outside academic centres, both before and since the appointed day, suggests that an entirely whole-time service lacks flexibility. Impediments have too often been placed in the strait and narrow path of those who are willing and able to do additional work rather than in the primrose path of those who are content with doing too little. In practice, it has been found, the best service is given by people who have been appointed to posts suited to their temperaments, as well as to their special experience and skills.

Fundamentally, the demand for part-time consultants comes from the general public, who still want to preserve an independent second opinion and the right to nominate their own consultant. All political parties agree in wishing to establish and maintain a really good hospital service; but the N.H.S. can never guarantee to give a patient continuous care by the consultant he would prefer. For many, the name and reputation of a hospital suffices; but a proportion of people in all classes still have a strong wish to secure, for themselves or their relatives, the attention of a particular physician or surgeon; and their freedom to do so must disappear unless part-time practice is allowed. In some specialties the demand for private treatment is less, whether because treatment must continue for a long time or because the service to be rendered is less personal. Thus it is natural that in psychiatry and tuberculosis, and in the diagnostic services such as radiology and pathology, more of the appointments should be whole-time.

Unhappily the distinction between whole-time and part-time appointments has led to disunity among consultants; and this has been increased by semipolitical controversy. The difficulties arise, however, not so much from the distinction itself as from the differences in the terms of service for whole-time and part-time posts. Though the Minister of Health has very properly reminded us that consultants are not primarily whole-time or primarily part-time—"they are primarily *doctors*" [2]—there are all too many signs that, under the existing conditions, two grades are now recognised. The monetary and other practical advantages of those working part-time were well brought out by Dr. GILCHRIST in his letter of Jan. 23, and in the correspondence it has evoked. The main differences are in respect of travelling allowances, other professional expenses, and domiciliary consultations. As Dr. GILCHRIST pointed out, the Spens Committee assumed that whole-time specialists would be paid "any sums which represent expenses reasonably incurred in the course of their work" in addition to the salaries recommended, and that these allowances would not be liable to tax:

> "The Evidence Committee has brought to our notice a number of items of expense which must be met if the specialist is to perform his duties efficiently. These include car expenses; expenses of travel apart from the use of a car; the cost of renewal of instruments and other equipment; the cost of books and journals, preparation of scientific papers, and subscriptions to professional societies; printing, stationery, postage and telephone costs; expenses of attendance at national and international professional meetings; and the expenses of visiting hospitals and clinics at home and abroad, and entertaining visiting colleagues."

In point of fact few of these expenses and allowances have been granted, and none of them adequately met, for whole-time workers. For travelling expenses, the discrepancy is particularly gross; for a part-time consultant may get a travelling allowance of up to £190 per annum for routine visits to his main hospital. Most people outside the profession, and many inside it, cannot see why specialists should be paid for travelling to and from their hospital, unless exceptional distances have to be covered. The objections to the present arrangements for domiciliary consultations for whole-time workers have been displayed by Dr. MAYON-WHITE and others, who have demonstrated the harm these arrangements are doing to the service. The public is not getting the full benefit of domiciliary consulta-

1. *Lancet*, Feb. 6, 1954, p. 313.

2. See *Ibid*, Feb. 13, 1954, p. 360.

tion, because the general practitioners are unwilling to call out whole-time consultants, even when no part-time consultant is at hand.

Nobody supposed that the mechanism of the N.H.S. would not develop faults requiring modification from time to time by new regulations or by amending Acts; and clearly there is now a strong case for reviewing the terms and conditions of service of consultants. What is conspicuously required is a formula that will remove the artificial distinction between those whose work is basically similar. Any review of consultant terms of service must, however, also include reconsideration of the basic scale of remuneration, which, in view of the Danckwerts award, cannot be regarded as fulfilling the recommendations of the Spens Committee. Referring to income increases since 1939 both in the medical and in other professions, the committee said that "it is only if corresponding changes are made in the incomes of consultants and specialists that the recruitment and status of the various branches of specialist practice will be maintained"; and the award of a realistic betterment factor to practitioners but not to specialists has in fact removed most if not all of the financial advantage that formerly compensated the young consultant for spending additional years in training. In stating that the remuneration of consultants and their juniors has been under consideration by the Medical Whitley Council for 16–17 months the Minister described it as a matter of profound importance (p. 567). "I think," he said, "we are now nearing a conclusion."

Selective Pituitary Failure

THE anterior pituitary gland contains three types of epithelial cells and secretes at least six different hormones. At present it is uncertain which hormones are formed in which cells. The chromophobe cells do not seem to have secretory activity, and the hormones are probably formed in either the acidophil or basophil cells. ALBRIGHT and ELRICK [1] have produced evidence that the growth hormone, the lactogenic hormone (also called prolactin, and identical with the luteotrophic hormone which induces progestational effects), corticotrophin (A.C.T.H.), and the thyrotrophic hormone are all elaborated in the acidophil cells; and only the follicle-stimulating hormone and the luteinising hormone (which is responsible for the development of the corpus luteum but not for its maintenance) are formed in the basophil cells. This concept accords fairly well with the clinical facts and is largely confirmed by modern cytochemical studies of the pituitary gland so ably developed and applied by PEARSE.[2] There is some evidence, however, that thyrotrophic hormone may be formed in the basophil cells, and the Crooke's changes found in Cushing's syndrome also suggest that corticotrophin may be elaborated there.

Failure of the secretory activity of the anterior pituitary gland is made manifest by a clinical syndrome first described by SIMMONDS [3] and later extensively studied by SHEEHAN and SUMMERS.[4] The commonest cause is necrosis of the gland due to thrombosis of its blood-vessels following postpartum hæmorrhage and shock; but other causes of panhypopituitarism include tumours and cysts (particularly chromophobe adenomas and craniopharyngiomas), trauma, infections, and granulomata. The clinical picture is explicable on the basis of failure of the pituitary to secrete the trophic hormones which maintain the normal activity of the gonadal, thyroid, and adrenal glands. Fully developed panhypopituitarism, with destruction of 75–95% of the gland, is not difficult to recognise. There is amenorrhœa or impotence and loss of libido, and the gonads and genital tract are atrophic. Pigmentation is deficient. The face is pale and flabby with thinning of the eyebrows; there is loss of pubic and axillary hair and absence of sweating; the skin is usually soft and may be wrinkled. The thyroid is often impalpable, and increased sensitivity to cold keeps the patient huddled over a fire. Physical weakness is profound and is associated with a peculiar mental torpidity. Attacks of hypoglycæmia and frank coma, attributed to a low blood-sugar level or hypothermia, may occur in the later stages of the disease. The progress of the clinical picture usually follows a definite course. First there is loss of sexual function associated with the diminished urinary excretion of gonadotrophins and of 17-ketosteroids (the formation of which may well require not only corticotrophin but also the luteinising hormone). Later, clinical evidence of hypothyroidism is added; and evidence of adrenocortical failure, apart from low 17-ketosteroid excretion, usually appears last.

Often the destruction of the anterior pituitary is less complete and the syndrome less severe. Thus instead of amenorrhœa there may be oligomenorrhœa, and the more obvious features of hypothyroidism may be lacking although sensitivity to cold and a lowered basal metabolic rate indicate deficient thyroid function. Adrenal deficiency, other than deficiency in androgen formation, may be revealed only by special laboratory tests or when provoked by some stressful situation such as bronchopneumonia. Sometimes failure affects one of the three target glands more than the others, but careful clinical and laboratory investigation will show that each is involved.

It is now apparent that, besides complete or partial panhypopituitarism, we may have to recognise selective pituitary failure [5]—that is, failure of the anterior pituitary to elaborate one particular trophic hormone while the secretion of the others continues normally. This type of hypopituitarism is perhaps to be expected, when one recalls that overactivity of the anterior pituitary can give rise to so circumscribed an entity as acromegaly. Selective pituitary failure is detectable only by hormonal assay; for often there is in life no obvious pathological lesion in the pituitary, and clinically the disorder may be indistinguishable from primary failure of the target gland. The commonest type is diminished or absent secretion of gonadotrophins: often this is due to pituitary inhibition by hypothalmic influences, and it has been observed, for instance, in student nurses, and in women who were interned in Japanese prisoner-of-war camps before starvation could be an ætiological factor.[6] Malnutrition from any cause may reduce the secretion

1. Albright, F., Elrick, H. *Trans. Ass. Amer. Phys.* 1948, **61**, 42.
2. Pearse, A. G. E. *J. Path. Bact.* 1952, **64**, 791; *Ibid*, 1953, **65**, 355; *In* Ciba Foundation Colloquia on Endocrinology. London. 1952; vol. 4, p. 1.
3. Simmonds, M. *Virchows Arch.* 1914, **217**, 226.
4. Sheehan, H. L. *Quart. J. med.* 1939, **8**, 277. Sheehan, H. L., Summers, V. K. *Ibid*, 1949, **18**, 319.
5. Hubble, D. *Lancet*, 1952, **i**, 1123.
6. Sydenham, A. *Brit. med. J.* 1946, **ii**, 159. Jacob, E. C. *J. clin. Endocrin.* 1948, **8**, 227. Bowan, W. E., Reifenstein, E. C. *In* Progress in Clinical Endocrinology. New York, 1950; p. 327.

of gonadotrophins: this commonly happens in anorexia nervosa, though in this condition amenorrhœa may sometimes precede the anorexia and is then attributable to hypothalamic inhibition.[7] In these circumstances failure of gonadotrophin secretion is reversible, and normal menstruation is resumed when the nutritional deprivation or psychic factors are corrected. Gonadotrophin may also be absent through a genetic defect which causes permanent hypogonadism. By assaying urinary excretion of follicle-stimulating hormone and by ovarian or testicular biopsy this disorder can be distinguished from primary gonadal failure, in which the urinary excretion of follicle-stimulating hormone is increased.[8] Selective failure of the growth hormone has been observed in dwarfed mice [9] but is rare in man,[10] and no instance of selective failure of corticotrophin secretion only has been reported. It has been suggested that some cases of cretinism may be due to failure of secretion of thyrotrophic hormone, but the evidence is not convincing.[11]

Sometimes selective pituitary failure involves two trophic hormones. Dwarfism may be combined with hypogonadism due to pituitary causes, and recently MADDOCK and his colleagues [12] have described hypogonadism in males associated with apparent deficiency of corticotrophin production but normal thyroid function. These workers used rather indirect indices for determining adrenocortical function; but in each of their four patients the excretion of 17-ketosteroids was lower than would be expected from gonadal failure alone, and one patient had frank addisonian crises. The combination of gonadotrophin and corticotrophin failure suggests that these two hormones are elaborated in the same pituitary cells—the basophils. Doubtless other examples of selective pituitary failure will be reported, and valuable information will be obtained if careful hormonal assays in life are correlated with the cytochemical changes in the pituitary after death. Only in this way will it be possible to determine the cellular origin of the pituitary trophic hormones.

Men against Worms

THE relationship of parasitic worms with their hosts raises fascinating but difficult problems alike for academic workers, medical practitioners, veterinarians, and agriculturists. Knowledge of the life-histories of these worms and of the routes by which they enter and leave the host has shown how infestation may be reduced or prevented; but such measures, though fairly simple in themselves, are difficult and expensive to apply. When prevention fails, anthelmintics (or a proteolytic enzyme [13]) can be given; but many of these are only partly effective and they may be dangerous to a host debilitated by the parasite. Infestation can be countered in at least two other ways: (1) by building up and maintaining in the host a high level of resistance; or (2) by finding out how the parasite feeds and what it derives from the host, in order either to help the host by adding to the diet more of these elements or to starve out the parasite by withholding them.

Much further experimental work is needed on the nutrition of helminth and host; but doctors cannot easily make nutritional experiments on human hosts, and veterinarians are impeded by the cost of animals. This work would be aided by sterile culture of cestodes, flukes, and roundworms derived from a warm-blooded host, so that their physiological processes could be studied in vitro. As HUNTER [14] points out, SMYTH [15] and JOYEUX and BAER [16] have cultivated tapeworms from fish-eating birds, but in cultures these appear to live on their food-reserves without revealing their normal modes of feeding. Also GLÄSER [17] cultivated a nematode parasitic in the Japanese beetle. But, despite many attempts, no helminth parasitic in a mammal has yet been cultivated. Lacking any more direct method, many workers have approached the problem by way of the host's diet. There is now evidence that the well-fed host suffers least from the effect of infestation. The host is defended by good supplies of vitamins A and D and those of the B complex, and, with tapeworm infestation, by restriction of carbohydrate intake.[18] In the case of blood-sucking helminths the host needs enough iron to make good the loss of hæmoglobin. (NYBERG [19] and von BONSDORFF and GORDIN [20] have found that the body of the fish-tapeworm, *Diphyllobothrium latum*, is rich in vitamin B_{12}, and they suggest that oral administration of the dried substance of this tapeworm will benefit the anæmia it causes.) Iron should normally be given to correct anæmia before anthelmintics are administered; and possibly deaths caused by the anthelmintic phenothiazine, which may itself cause anæmia, might have been averted by this means. On the other hand, it seems that human hookworms become less resistant to anthelmintics as the host becomes more anæmic; and this suggests that it is best to begin anthelmintic treatment while the worms are thus debilitated. Do the hookworms use the blood they suck as food? Apparently not. WELLS [21] estimated that a single dog-hookworm may remove from the host 0·84 ml. of arterial blood daily, and suggested that this blood was used for respiration. ROGERS [22] found several kinds of hæmoglobin in nematodes parasitic on domesticated animals; and the host's blood may be used for the manufacture of these.

What has so far been learnt of the physiology of helminths has shown no certain means of interrupting their life-cycles in the host. Perhaps this may eventually prove feasible by withholding an essential enzyme; but meanwhile much greater resources should be devoted to research. In man parasitic helminths account for an enormous amount of illness; infestation of animals deprives the world of food that it cannot afford to forego.

7. Sheldon, J. H. Cited by D. Hubble (footnote 5).
8. Howard, R. P., Sniffen, R. C., Simmons, F. A., Albright, F. *J. clin. Endocrin.* 1950, **10**, 121.
9. Smith, P. E., MacDowell, F. M. *Anat. Rec.* 1931, **50**, 85.
10. Hewer, T. F. *J. Endocrin.* 1944, **3**, 397.
11. De Robertis, E. *J. clin. Endocrin.* 1948, **8**, 956. D'Angelo, S. A. *Endocrinology*, 1951, **48**, 341.
12. Maddock, W. O., Leach, R. B., Klein, S. P., Myers, G. B. *Amer. J. med. Sci.* 1953, **226**, 509.
13. MacCarthy, E. *Lancet*, Feb. 27, 1954, p. 436.
14. Hunter, G. C. *Nutr. Abstr. Rev.* 1953, **23**, 705.
15. Smyth, J. D. *J. exp. Biol.* 1946, **23**, 47.
16. Joyeux, C., Baer, J. C. *Bull. Mus. Hist. nat. Marseille*, 1942, **2**, 1.
17. Gläser, R. *Science*, 1931, **73**, 614; State of New Jersey Department of Agriculture, Bulletin no. **211**, 1932, p. 1.
18. Chandler, A. C. *Amer. J. Hyg.* 1943, **37**, 121.
19. Nyberg, W. *Acta med. scand.* 1952, **144**, suppl. 271.
20. von Bonsdorff, B., Gordin, R. *Ibid*, 1952, **142**, suppl. 266; *Ibid*, 1953, **144**, 263.
21. Wells, H. S. *J. Parasit.* 1931, **17**, 167.
22. Rogers, W. P. *Austr. J. sci. Res.* B, 1949, **2**, 287.

Annotations

MEDICINE IN THE ROYAL NAVY

FROM the first volume of the official history of the Royal Naval Medical Service in the late war,[1] we learn something of this service's vast administrative responsibilities. The book contains excellent accounts of the inter-war period; of the problems of a sudden, extreme expansion of medical, dental, and nursing personnel, establishments, supplies, and transport; of the coincident development of the Naval Air Arm; of immense commitments in preventive medicine; and of coöperation with the other medical services, the new Ministries of Supply and War Transport, the Central Medical War and Medical Personnel (Priority) Committees, and the Medical Research Council. Perhaps the most valuable account for future reference is the anonymous one on the blood-transfusion service, with its comprehensive records. The book's balance and perspective are those of a history, the medical picture being placed within the general naval framework. It is not intended for detailed reference, and those who consult an individual section will be disappointed.

The editor has given unity to the work by maintaining a cheerful, good-natured style throughout, and the reader is lulled into the pleasing belief that *tout comprendre, c'est tout pardonner*. But the nation which has paid for this official history was entitled to a more self-critical approach. Great changes are evidently needed, yet this work does little to advocate them: it suffers from the limitations of an autobiography, with the added restraints of naval discipline, loyalty, and, as regards research, security. Happily the facts are recorded, and the reader who retains his critical faculty will be able to detect various mistakes of policy besides the few which are prefaced by "it is a matter for regret," or summarised as "some slight difficulty," or glossed over as "unfortunate but inevitable." It is, however, easy to miss the brief statement on p. 184 that "the casualties caused by preventable diseases far exceeded the casualties due to weapons." Their Lordships employed medical personnel lavishly, but not always wisely. The nation may well ask the Board of Admiralty why only one out of eleven hospital ships acquired for the war was selected in consultation with their medical department (p. 113), and why this department waited until after the war to assess the value of these ships in which staff and stores were so often immobilised during repeated adaptations. But this section closes merely with the comment that it is more fitting to praise the medical personnel than to condemn the organisation.

Careful scrutiny of this volume reveals frequent evidence of the need for the Board to consult and confide in their medical department more completely, for this department to be better integrated into the Service, and for its requirements to be given a higher priority.

THE UNITED NATIONS AND WORLD POPULATION

IN a recent review[2] Dr. Evang, the director-general of the Norwegian Public Health Service, sketches a background for the conference on world population which the United Nations is holding in Sweden next September. The secretary-general of the United Nations is inviting, in their individual capacity, experts nominated by governments, by various scientific organisations, and by the specialised agencies W.H.O., F.A.O., UNESCO, and I.L.O. Topics for discussion will include mortality and fertility trends, with special attention to areas of lower death-rates and of high death-rates; international migration; population in relation to national resources and agricultural development, and in relation to capital formation, investments, and employment; social aspects of population changes; and methods of demographic measurement.

Dr. Evang has been a leader in the demand that the increase in world population should be considered both as a medical problem and as one requiring international study. As head of the Norwegian delegation to the Fifth Health Assembly last year he put forward a resolution inviting the director-general of W.H.O. to "establish an expert committee to examine and report on the health aspect of this problem." Though this gained some support, a counter-proposal "that from the purely medical standpoint population problems do not require any particular attention on the part of W.H.O. at the present time" was strongly pressed by many countries—notably those with a large Roman Catholic population—and the matter was dropped. Clearly, with this division of opinion, any international conference must be limited to individual experts and cannot contain government representatives or delegates. Dr. Evang argues that there is little sense in saving millions of lives through combating disease, if the survivors are to die from hunger or live the miserable life of undernutrition and malnutrition. "Death control must be balanced by birth control" is the sum of his plea.

GAMMA-GLOBULIN IN POLIOMYELITIS

IT is little more than a year since we welcomed[1] the news that, in a carefully conducted trial by Hammon and his colleagues,[2] gamma-globulin had shown a slight but significant protective action in poliomyelitis. But a recent report[3] suggests that things are not turning out as well as everyone hoped. A committee of the U.S. Public Health Service, meeting at Atlanta at the end of January, examined the effects of mass inoculations with gamma-globulin in the summer of 1953, and they concluded that there was no evidence of any beneficial results. In most of the cities where gamma-globulin was used, the inoculations were performed after the peak of the epidemic had passed, so there was little chance of demonstrating any modification in the course of the epidemic. Gamma-globulin was also given to "family contacts" of recognised cases; but the number of subsequent paralyses in these households was not significantly reduced, nor was there any measurable effect on the severity of the paralyses. It was felt, therefore, that more experience and investigation would be needed before the efficacy of gamma-globulin could be assessed.

Why did the results of the 1952 and 1953 trials differ in this way? For one thing, in the 1952 trial, controls were injected with gelatin solution, whereas last summer uninjected people were used as controls. Hammon et al.[2] appreciated the possibility that inoculation of gelatin, like that of many other substances, might provoke paralytic poliomyelitis in certain cases, and so give gamma-globulin a false reputation for protective action. Moreover, the conditions of the two trials were very different, and it is possible that a small effect in a population under careful observation might not be noticeable in a larger and more heterogeneous population in which the risk of exposure to virus was very variable. Whatever the explanation, the results are disappointing and they will strengthen the doubts of many people in this country who already thought that the widespread use of gamma-globulin in poliomyelitis was impracticable. On the other hand, in the United States, plans are going forward, and the president of the National Foundation for Infantile Paralysis has announced[3] that three

1. History of the Second World War: The Royal Naval Medical Service. Vol. I.: Administration. Edited by Surgeon Commander J. L. S. COULTER, D.S.C., R.N. H.M. Stationery Office. 1945. Pp. 512. 50s.
2. Evang, G. *Eugen. Rev.* 1953, **45**, 247.

1. See *Lancet*, 1952, ii, 970.
2. Hammon, W. M., Coriell, L. L., Stokes, J. jun. *J. Amer. med. Ass.* 1952, **150**, 739.
3. *New York Times*, Feb. 23, 1954.

million doses of gamma-globulin will be available for mass inoculations this year, compared with one million last year; and an unusual position may conceivably arise in which the supply of gamma-globulin exceeds the demand. In view of these developments, the vaccination trial [4] which the National Foundation is carrying out this year becomes more important than ever. Approximately 500,000 children are being vaccinated with an inactivated tissue-culture vaccine to see whether it will protect them against paralytic poliomyelitis.

THE MENTAL HEALTH RESEARCH FUND

MENTAL health has seldom been a warmly favoured child of those who disburse research grants; and the demands on the Mental Health Research Fund, founded in 1949, are likely to be great and growing for many years to come. What it has done already, and what it hopes to do, are set out in the current issue of the *Journal of Mental Science*.[5]

Careful thought has been given to the lines on which it should develop. A conference held at Oxford in the spring of 1952,[6] to which were invited scientists from all branches of research bearing on mind and brain, provided "a clear though complex picture" of what is going on in territory which extends from the anatomy of the nervous system and the biochemical and electrical activities of the brain on one hand to the work of the child-guidance clinic, the mental hospital, and the special school on the other. The fund takes all this for its province, its objects being:

"To promote, finance, and encourage research on mental health and disease, notably: (*a*) study of the factors conducive to the fullest development and maintenance of man's mental capacity; (*b*) research on the causation, prevention and cure of nervous and mental illness; (*c*) research on fundamental problems related to mental health, such as the physiology of the nervous system; (*d*) research on the forms of social structure most likely to lead to the improvement of the mental quality and stamina of the community and most likely to reduce the incidence of addiction, delinquency and crime."

Some of the ground has been further explored. The Oxford conference led to one on the psychological development of the child, convened by the World Health Organisation at Geneva in 1953; and this was followed by another on the same subject two months ago. A meeting, in Bristol, of biochemists and others who had attended the Oxford conference resulted in plans for a symposium on the development of the nervous system, to be held at Oxford next July; and this will be organised and sponsored by the fund. Then, research projects are to be fostered by one or more fellowships carrying salaries of £1000–1500, and applications are soon to be invited for the first of these, the only stipulation being that the applicant must be willing to undertake work which has some bearing on mental health.

The fund has decided on some general rules as to the ways in which it can best use its resources. As occasion offers, it will finance conferences between research-workers—either small groups approaching a single topic from different aspects, or larger groups with a bigger range. It will also make travel and subsistence grants to workers who wish to confer with colleagues of similar interests, to visit a different laboratory to learn a new technique, or take part in joint research at some other centre. It will foster the projects of individuals either by means of fellowships, or by adding something to an existing salary so as to enable the worker to continue, indefinitely or for a limited time, in research, or by paying an alternative person so as to release the worker from part of his duties, or by means of grants for equipment and technical help. Prizes and awards will be given, at two-yearly or other regular intervals, and these will include awards, given without previous notification, to young research-workers, for advances which bear on mental health. The fund will also support efforts (either its own or those of any other approved body) to raise the amount of public or other research funds allocated to mental-health research: it will, for instance, advocate that the number of research professorships and directorships of clinical research in mental hospitals be increased, and that the conditions of service of research-workers should be improved, and interest in this field stimulated. Finally, it will support any other project bearing on mental health which does not fall into any of the classes enumerated, but which the research committee consider deserves approval. This committee will also have the task of selecting projects to be given financial help. It will base its decisions on the ability of the man who is to undertake the work, on the situation in mental-health research at the time of his request, on the extent to which funds may be had from other sources, and on whether the men and material seem sufficient to get decisive results. Generally the preference will be given, as mentioned already, to projects which can be attacked in coöperation by workers trained in different disciplines and having different skills.

This programme, which is in the best tradition of English grant-giving bodies, has a warmth and energy about it appropriate to the spring season in which it is growing: it should set the sap rising in mental-health research.

SYSTEMIC LUPUS ERYTHEMATOSUS

COLLAGEN disease is now fashionable, so it is liable to be diagnosed whenever the signs and symptoms do not seem to fit together. Certainly the clinical picture of systemic lupus erythematosus is bizarre enough. Gold and Gowing [1] note that this disorder occurs almost exclusively in young women between the ages of 20 and 40. As regards the skin lesions, chronic discoid lupus erythematosus may progress sometimes to the systemic variety; in addition there may be "a wide variety of rashes occurring simultaneously or in succession." Purpura of thrombocytopenic type may be the presenting sign. Arthritic symptoms are prominent; and usually they are relatively acute. The muscles may be swollen and tender, as in dermatomyositis. Renal symptoms are uncommon; but progressive renal involvement, when it does occur, is always a bad prognostic sign. Diarrhœa is often troublesome, and various other gastro-intestinal symptoms have been recorded. Pleural effusion is frequent and, when accompanied by pericardial effusion and ascites, may be wrongly ascribed to "polyserositis." Widespread enlargement of lymph-glands is common, splenomegaly less so. Sometimes focal vascular lesions in the central nervous system give rise to signs. This list is not exhaustive; for instance, Rapaport et al.[2] have lately described 2 patients with presenting signs and symptoms in the lungs.

In diagnosis clinical pathology gives much-needed help. The most important biochemical change, according to Gold and Gowing, is hyperglobulinæmia; and "the diagnosis should be suspect if this is absent." This hyperglobulinæmia is reflected in abnormal results of other tests—for instance, increased erythrocyte-sedimentation rate (E.S.R.) and an occasional false positive Wassermann or Kahn reaction. The Coombs anti-globulin reaction for red cells may also be positive: Gold and Gowing had 8 positives in their 26 cases. Furthermore multiple antibodies may be formed after blood-transfusion; for example, in a case described by Callender et al.[3] 5 separate antibodies developed after multiple transfusions. Routine blood examination shows no

4. See *Lancet*, 1953, ii, 872.
5. January, 1954, p. 10.
6. See *Lancet*, 1952, i, 651, 664.

1. Gold, S. C., Gowing, N. F. C. *Quart. J. Med.* 1953, **22**, 457.
2. Rapaport, S. I., Meister, L., Steele, F. M., Caniglia, S. R. *Ann. rheum. Dis.* 1953, **12**, 268.
3. Callender, S. T., Race, R. R., Paykoç, Z. V. *Brit. med. J.* 1945, ii, 83.

diagnostic points, except perhaps leucopenia and relative monocytosis.[4] The presence of "L.E. cells" in the blood [5] confirms the diagnosis, but their absence does not exclude it. Gold and Gowing found such cells in only 6 out of 15 patients tested; but other workers have found them in a much higher proportion of cases.[6] Possibly the L.E.-cell phenomenon is not as specific as has been thought; it may be another sign of disturbed antibody mechanisms. Barbier [7] has obtained a positive L.E.-cell test in a patient with allergic skin reactions after administration of penicillin and sulphonamides, and he notes that 15 similar cases have been recorded. The urine commonly contains both red and white blood-cells and sometimes hyaline or waxy casts; albuminuria may or may not be found.

Of the many morbid-anatomical changes that which has attracted most attention is fibrinoid degeneration of collagen-fibres. This degeneration, which is also a feature of other collagen diseases, is followed by hyalinisation and sclerosis. In addition there may be true fibroblastic proliferation, necrosis of connective-tissue cells, and inflammatory (usually "round-cell") infiltration of the degenerate or necrotic tissues. In clinically typical cases, however, the changes found at necropsy may be very slight.

The ætiology of lupus erythematosus is quite unknown. Baehr and his co-workers in the U.S.A. have regarded chronic discoid lupus and systemic lupus erythematosus as clinically distinct conditions; but lately the opinion that the two conditions are stages of the same disease has been gaining support. Sir Henry Cohen and Dr. Cadman [8] have reported a series of cases showing transition stages from the chronic discoid form, without the biochemical changes of systemic lupus erythematosus, to the acute systemic form with typical changes. Gold and Gowing are convinced that the two conditions are intimately related, especially as careful investigation of cases of the chronic discoid type often reveals biochemical changes found in the systemic type, such as hyperglobulinæmia or raised E.S.R. But although it seems that the discoid form does sometimes develop into the systemic, most cases of systemic lupus erythematosus have not passed through a discoid stage. Both conditions show features of hypersensitivity states, and in systemic lupus there is evidence of gross disturbance of antibody reactions and formation. The factor that produces the L.E.-cell phenomenon is now known to be a gamma-globulin that differs immunologically from normal gamma-globulin.[9] Recently Bridge and Foley [10] have described the transmission across the placenta of the L.E. factor. A patient with systemic lupus erythematosus controlled by regular cortisone treatment was delivered of a full-term child; the baby's blood at first gave a positive L.E.-cell test, but 7 weeks after birth the effect could hardly be detected and at 4 months the test was quite negative; the mother's blood continued to give a positive test. Lupus erythematosus may well fit into the group of conditions named by Ehrich [11] the "dysgammaglobulinæmias." Such a grouping explains the observation that all "specific" tests and reactions for lupus erythematosus can be positive in other related diseases; as in so many other diseases, it is the total clinical and pathological picture that leads to a proper diagnosis.

Interest in systemic lupus and its accurate diagnosis has been stimulated by reports that the disease may be successfully controlled by cortisone or corticotrophin. Most of these reports come from the U.S.A., but Cohen and Cadman in this country have reported good results in 5 cases of acute systemic lupus erythematosus with corticotrophin and cortisone. They note that fever, anorexia, and malaise remitted within a few hours after the start of treatment, joint pains and the rash within a week, and lymphadenopathy and splenomegaly within 3 weeks. Cohen and Cadman gave maintenance treatment with oral cortisone in doses varying from 37·5 mg. to 75 mg. daily for 8–30 months without relapse; but, like others, they found that the L.E.-cell phenomenon persisted—it became negative only in 1 case. They agree with Dubois et al.[12] that mild cases should be given a chance of spontaneous remission, which cortisone treatment may inhibit. Treatment with these hormones is not always satisfactory, and other methods have been tried. Rohn and Bond [13] used nitrogen mustard and triethylenemelamine in relatively small doses, and claim to have induced remissions varying from 6 to 217 days in 7 patients—results that compare favourably with those from cortisone. The mode of action of these drugs is far from clear, but if systemic lupus erythematosus is in fact an antibody disturbance there is some ground for using cortisone or corticotrophin. Until we have a better remedy patients should be given the benefit of a trial with these substances.

SHOCK TREATMENT AND PSYCHE

ALTHOUGH widely practised in modern psychiatry, shock treatment—whether by electroconvulsive therapy, convulsant drugs, or insulin coma—is apt to be left to those psychiatrists who are less interested than others in psychotherapy. The views of Abse [14] are based on long experience both of psychotherapy and of shock methods.

Abse considers that the essence of all forms of shock treatment is the traumatic situation in which the patient is placed. This causes physiological changes, which are normally reversible, and also psychic effects, which are irreversible even when produced during unconsciousness. In support of this belief, he instances not only the patient's overt anxiety about the treatment or its preliminaries, but the revelation during concomitant or subsequent psychotherapy of fantasies concerned with death and destruction, of being raped or overwhelmed, or of undergoing dangerous and terrifying experiences. These fantasies, he says, derive not only from the circumstances of the treatment but from the activation of pre-existent unconscious fantasies; and he cites Freud's [15] dictum that events occurring in the absence of consciousness may produce powerful intrapsychic effects.

The repeatedly induced traumatic situation may bring about two beneficial types of response—improved contact with reality, and relief of depression. The first of these Abse attributes to the anxiety evoked by the traumatic situation stimulating the ego's defences and enabling it to repress id impulses more effectively: in this therapeutic process he sees an analogy to the normal development of reality-testing in the infant, according to the orthodox psycho-analytical theory by which the infant ego is driven by anxiety to repress some of its instinctual impulses and to turn to the outside world to seek need-satisfying objects for the remainder. Shock methods, he points out, may stimulate other types of ego defences, and where these take the form of regressive or projective mechanisms the treatment may be ineffective or actually harmful. The second main therapeutic effect—the relief of depression—he believes to be due to the relief of tension between ego and superego consequent on the unconscious experiencing of a situation equivalent to punishment. Normally the ego represses id impulses at the behest of the superego, but where this function is

4. Stickney, J. M. *Proc. Mayo Clin.* 1940, **15**, 680.
5. See *Lancet*, 1951, ii, 110.
6. Zimmer, F. E., Hargraves, M. M. *Proc. Mayo Clin.* 1952, **27**, 424.
7. Barbier, F. *Acta med. scand.* 1953, **147**, 325.
8. Cohen, H., Cadman, E. F. B. *Lancet*, 1953, ii, 305.
9. Haserick, J. R., Lewis, L. A. *Blood*, 1950, **5**, 718.
10. Bridge, R. G., Foley, F. E. *Amer. J. med. Sci.* 1954, **227**, 1.
11. Ehrich, W. E. *Amer. Heart J.* 1952, **43**, 121.
12. Dubois, E. L., Commons, R. R., Starr, P., Stein, C. S., Morrison, R. *J. Amer. med. Ass.* 1952, **149**, 995.
13. Rohn, R. J., Bond, W. H. *Amer. J. med. Sci.* 1953, **226**, 179.
14. Abse, D. W. *Quart. Rev. Psychiat. Neurol., Int. Rec. Med.* 1951, **166**, 287; *J. ment. Sci.* 1940, **86**, 95; *Brit. J. med. Psychol.* 1942, **19**, 262; *Ibid*, 1944, **20**, 33; *Ibid.* 1949, **22**, 194.
15. Freud, S. Collected Papers. London, 1924; vol. i, chapter 2.

weak or impaired it may use a sort of "last ditch" defence, blocking the id's access to mental formulation or motor expression of the intolerable impulses. Clinically, this condition shows itself in psychomotor retardation, a massive form of outer defence characteristic of psychosis. The unquestionable benefit which these patients usually derive from shock treatment Abse attributes to the anxiety generated by the traumatic situation causing the ego to defend itself more vigorously, with the result therefore that psychomotor blocking can be discarded.

Abse maintains that, in schizophrenia, treatment by insulin coma is more effective than other forms of shock treatment, owing to the emphasis in this technique on what he terms the "loving care" aspect of treatment. The patient receives longer and more assiduous attention, and the physiological disturbance is of a specifically hunger-producing kind. The patient experiences intense oral needs and may express feelings of gratitude towards the nurse who gives him a sugared drink on the termination of coma, re-experiencing emotions felt in early infancy at his mother's breast.

Abse refers to some disadvantages of shock treatment from the psychological angle. Masochistic trends may be reinforced and subsequent psychotherapy rendered more difficult. The patient may be rendered even more afraid of relinquishing inexpedient and self-sacrificing devices than he was before the onset of his illness. The presence in a patient of considerable ego assets, which are likely to render psychotherapy more rewarding, should be regarded as a contra-indication to shock treatment. Indeed, Abse believes that psychotherapy should always be first considered or given a trial, and that the choice of psychotherapy or a particular shock method should be based on careful appraisal of the individual case.

TENDON LESIONS IN RHEUMATOID ARTHRITIS

THE tendon lesions found in rheumatoid arthritis are usually inconspicuous and unimportant compared with the damage in nearby joints. Occasionally, however, these lesions contribute significantly to a patient's disability; and, as Ansell and Bywaters [1] point out, they may even be the main feature of the rheumatoid process.

Such tendon lesions, first described by Helweg,[2] are present in 40–50% of cases of rheumatoid arthritis.[2–4] Most often the tendons of the long flexors of the fingers are affected, and less commonly the extensors of the fingers, the tendons round the ankle-joint, and the Achilles tendon.

The long flexor tendons of the fingers enter the palm by passing under the volar carpal ligament, at which level they are surrounded by the palmar synovial sheath. In the distal half of the palm the synovial sheath is lacking, and each tendon is covered merely by a thin fibrous sheath containing three well-developed transverse bands.[4] In rheumatoid arthritis the tendons may become thickened or even nodular, and symptoms develop when a nodule is jammed between the transverse bands. If the nodule is small it interferes with active flexion and may give rise to a "snapping" finger, but the patient complains more often of weak and painful fingers. A large nodule may become completely impacted and prevent any active flexion of the interphalangeal joints. In the exceptional cases where the joints are not greatly involved the clinical picture is easily recognised. The index and middle fingers are most commonly affected. On attempting to make a fist the patient flexes his metacarpo-phalangeal joints but his interphalangeal joints remain fully extended. Passive movement is, in contrast, full and painless; the joints themselves are not tender; and the nodule can be felt in the palm as the finger is moved. This disorder may improve spontaneously in early acute cases when the disease remits and the tendon thickening subsides, and also in progressive cases in which the fibrous bands soften.[4]

Kellgren and Ball [4] believe that operative release of nodular or thickened tendons is useful where active movement has not been regained even after the disease has become relatively quiescent. When pain is prominent, relief may be obtained by applying a volar plaster slab with the wrist in extension and the fingers in partial flexion; the plaster should be removed daily for gentle exercises. Wax baths followed by active and passive movement may also help, as also may injections of corticotrophin.[1] Ansell and Bywaters point out that if these lesions are not treated secondary changes may develop in other tissues and thus lead to irremediable disability; and they describe 3 cases in which contracture of fingers resulting from changes in tendons was the presenting abnormality.

Ansell and Bywaters declare that this disorder must be distinguished from scleroderma: although the skin may be smooth from lack of use it is neither bound down nor thickened, and telangiectases or loss of pulp or bone in the terminal phalanx are not seen. Contracture of fingers due to lesions of nerve, muscle (Volkmann's contracture, dermatomyositis), fascia (Dupuytren's contracture), or joints should be easily distinguished. In rheumatic fever nodules may also form in the tendons of the palm, producing a sticking finger [5–7]; but these nodules invariably resolve in a few days or weeks.[8] Similar contractures occur in "palindromic" rheumatism,[9] and in lupus erythematosus. In gout, accumulation of uric acid in a tendon may produce similar symptoms. "Snapping" finger is, of course, most commonly due to trauma.

The histological features of the tendon lesions of rheumatoid arthritis were established by Kellgren and Ball,[4] who recognised the valuable opportunity of studying the collagen changes of rheumatoid arthritis in a tissue composed almost exclusively of collagen fibres and ground-substance. Changes in the tendon ranged from œdematous separation of the fibres to reduction of the compact tendon-fibre system into a swollen, homogeneous, granular mass, at first containing a reticulin network but later becoming completely afibrillar. In adjacent mesotenon or peritenon much granulation tissue was seen—the tendon nodule itself was an expression of the exuberant production of this tissue in the active stages of the disease. Not infrequently nodules on the surface of the tendon could be regarded as a mass of granulation tissue isolated from parent connective tissue; and Kellgren and Ball, detecting in such nodules lesions identical with the subcutaneous necrobiotic foci of rheumatoid arthritis, suggested that one way in which such foci might be formed was by focal fibrinoid degeneration of preformed non-specific granulation tissue. Apparently, not only may collagen be involved by fibrinoid necrosis, but the associated granulation tissue is liable, at any stage in its development, to undergo similar degenerative changes, which in turn may stimulate further production of granulation tissue.

THE death is announced of Dr. KLOTHILDE GOLLWITZER-MEIER, professor of pathological physiology in the University of Hamburg. In 1949 she lectured at King's College, London, on Blood pH and Blood-flow during Muscular Activity.

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Special Articles

COST OF THE NATIONAL HEALTH SERVICE

Memorandum from the Royal College of Physicians to the Guillebaud Committee *

IN considering how a service should be financed one must consider its particular purpose and nature.

The name of the National Health Service is somewhat misleading. The Act of 1946 did not set up a national service, managed from London through local branches, like the Post Office. Though the Minister of Health took wide powers which he could hold in reserve, the Government's avowed object was to integrate, support, and supplement the work of existing medical agencies rather than to unify, regulate, or supersede them. The N.H.S. should in fact be regarded not as a centralised service, in which the hospitals and doctors at the periphery exist to carry out central instructions, but rather as a confederation of medical institutions whose activities need coördination and sometimes leadership. It is these institutions, varying in size from the single-handed practice to the large hospital, that actually look after patients; and, whether as individuals or groups, they develop their own methods and standards. It is they, not the Minister, who are directly responsible for what happens to the people who seek their help, and the Act was framed in such a way that personal responsibility to the patient, and local responsibility to the public, should be weakened as little as possible by the coördinating measures needed to ensure that everybody can get medical care.

"Effective Control"

Financial control from the centre might be made so "effective" as to prevent the truly efficient use of the funds provided. In the hospital service efficiency depends largely on finding able and knowledgeable members for committees and boards; and such people will eventually cease to give their time to this work if they have little or no money to spend as they think fit.

Hospital Management Committees

In the old voluntary hospital, whose administrative system has been taken as the pattern for the N.H.S., the control of expenditure was simple. It was the duty of each member of the medical staff to press for whatever development he thought necessary; it was the duty of the medical committee to consider which developments were most urgent, and recommend these to the governing board; and it was the duty of the board to review the recommendations and find the money for them if it could. But expenditure and expansion were limited by what the hospital could beg or borrow. Under the N.H.S. this local financial check on medical or administrative aspirations is removed, and the hospital, instead of collecting money of its own, competes with the other hospitals of the region for whatever it can get, under various headings. This budgetary competition leads to fewer anomalies than the previous competition by public appeals; but until better methods of costing are applied it will tend to favour the hospital that asks too much. As things now stand, a hospital loses by keeping its demands low and loses again by spending less than it is authorised to spend.

A sense of fuller responsibility, with incentives to economy, should be restored to management committees (1) by giving them the whole sum that they are authorised to spend during the year, (2) by making it easier for them to transfer expenditure from one budgetary heading to another, and (3) by letting them use savings for minor capital improvements or for establishing a contingency fund. Control over their house-keeping would be exercised by providing that deficits must be carried forward. A management committee finding itself in arrears would apply to the regional board, which (for good reason shown) might be prepared to pay off the deficit, in part or whole, from its own contingency fund; but failing such help the management committee would have to meet its obligations out of its own future income. Where a committee ran seriously into debt the Minister could properly order a public inquiry into the circumstances, and, if inefficiency was evident, could dismiss the management committee and appoint a commissioner to administer the hospital in its place.

If a committee is to act responsibly it must feel responsible; and it will never feel responsible unless it can make its own choices and its own mistakes. For a hospital, which cannot be run from a distance, a high degree of self-control, in both senses, is a necessity. Where administration is entrusted to a voluntary committee, the enforcement of penalties in case of failure or default is preferable to continual superintendence.

Regional Hospital Boards

What has been said is not a plea for complete autonomy for hospitals. The work of each hospital has to be done within the framework laid down by the regional board, whose primary function is to see that all the needs of the public are met. Naturally, the board, in its turn, must not depart from the general policies which integrate the service; but, so long as it is the channel through which money is distributed for the maintenance of hospitals, it must have power to reduce the supply to one consumer while increasing the supply to another. So long as it is the executive intermediary between the centre and the periphery, it should also be responsible for transmitting, and if need be interpreting, all directives or statements of policy to the hospitals of its region, and it should likewise receive the returns and accounts of those hospitals.

Its capital expenditure has to be planned in consultation with the Ministry; but, once a project has been approved in general terms, the board should be allowed to carry it out in its own way—the penalties of overspending being similar to those proposed for inefficient management committees. It is highly desirable—not undesirable—that different regions should tackle their problems, and spend their money, in different ways, so that experience of different methods shall be gained. Few things could do more to check the sound development of medical work than that every region should have to design every new institution, or draw up every local scheme, in accordance with a detailed blueprint in London—even when the blueprint is a good one.

Ministry of Health

At all levels major capital development should be planned over a period of years, and funds devoted to this purpose should be kept separate from funds for maintenance.

The outlook for the health of the N.H.S. would improve considerably if capital development were financed by grants-in-aid from the Exchequer to the Ministry for, say, five years at a time. Under present procedure small capital schemes are undertaken where larger ones might be more economical. In judging the comparative urgency of projects proposed by the regions

* The terms of reference of the Guillebaud Committee, which is now sitting, are: "To review the present and prospective cost of the National Health Service; to suggest means, whether by modifications in organisation or otherwise, of ensuring the most effective control and efficient use of such Exchequer funds as may be made available; to advise how, in view of the burdens on the Exchequer, a rising charge upon it can be avoided while providing for the maintenance of an adequate Service; and to make recommendations."

the Ministry should have the advice of some central advisory body, possessing the confidence of the professions concerned, which should be charged with keeping the developmental policy of the service under continuous review. It was hoped that the Central Health Services Council would fulfil this function, but it has not done so.

Because of the impossibility of foretelling future demands, the College would not like the maintenance of the service to be financed by a grant-in-aid extending over several years; but it nevertheless hopes that means can be devised by which the Ministry will receive what might be called an annual grant-in-aid—a round sum which it can use at its own discretion, with liberty to create a central contingency fund for the service.

It is said, of course, that the recipient of an annual grant (whether Ministry, regional board, or management committee) gains nothing from permission to keep its savings; for, when the next application comes to be considered, the grant-making authority (Chancellor, Ministry, or regional board) will insist that next year's allocation should be reduced by the amount of this year's saving. Admittedly, in the absence of a complete costing system, there will always be a tendency, or at least a temptation, to reduce the grants of those who have not spent them in full. But the fact that underspending is sometimes due to overestimating or to failure to fulfil a programme is not a sufficient reason for preventing the retention of savings which are the result of efficiency. If it were once recognised that it is legitimate to use savings for minor improvements or to establish a contingency fund, the grant-making authorities at all levels would at least be free to use their own judgment in deciding whether to preserve or destroy these incentives to economy. Common sense would suggest that so far as possible they should be preserved.

The Treasury

The College is well aware that established financial practice is incompatible with its wish that the Ministry, the regional boards, and the management committees should each receive the sum allocated to them and should bear full responsibility for its proper use. But social innovations so great as the N.H.S. may necessitate innovations also in financial practice. A system devised for controlling the expenditure of Government departments is not necessarily suitable for controlling the expenditure of a new kind of service administered basically by voluntary boards and committees. In the past five years, by continually exercising its final authority, the Treasury has assumed no small responsibility for the administration and development of the N.H.S. and has thereby weakened the responsibility felt by everybody else. Experience has shown that, applied to this particular service, the conventional system of financial control has in fact removed incentives to economy, encouraged peripheral expenditure on non-essentials, and antagonised or depressed many of the abler voluntary administrators on whom success depends.

The alternative is to place financial responsibility squarely on the people, at all levels, who are administering the service. With severe penalties for irresponsible over-spending, and real rewards for economy, the risk of the N.H.S. presenting supplementary estimates would be less than it is now.

"Modifications in Organisation"

Admittedly a compromise between several architectural styles, the structure of the N.H.S. is bound to look somewhat odd. But if any attempt at rebuilding were made in the near future the plans would still be based on opinion or prejudice rather than knowledge. Full discussion of eventual alterations is desirable, but any basic reconstruction would certainly be premature after less than six years' occupation of the 1948 premises.

The Regional Hospital Boards

The Select Committee on Estimates (1951) said that the Ministry either must give the regional boards more scope or must reorganise the service so that the boards will confine themselves to planning and advice. The College favours the former alternative.

As for abolishing the regional boards, which has sometimes been suggested, little would be gained, and much might be lost, by attempting this in the present phase of the service.

Transfer of Teaching Hospitals to Regional Boards?

The reasons for excluding the teaching hospitals from the regional structure were, and remain, very strong.†

† The strongest is perhaps the least ponderable: it is that socialisation of medical services involves danger to professional standards, and this danger will be reduced if teaching hospitals (like universities) are allowed to work to their own clinical and academic standards and in their own traditions, protected from the process of levelling-down too often seen in large groups that have to share their responsibilities. The student should see medicine practised as well as his teachers are able to practise it; and not only should each teaching school encourage differences in its teachers, but the system should encourage differences in the teaching schools.

There is an important difference in loyalties between regional boards and teaching hospitals, which would clash under one authority. The regional boards have the responsibility for building up regional hospital services, particularly in less well-developed areas. Teaching hospitals have the responsibility for fostering growing points of medicine as well as providing facilities for teaching and examinations; and all these may mean some sacrifice of the maximum turnover so much needed by regional boards. If there are disadvantages arising from control by these two separate authorities, increasing coöperation is working for the betterment of both, —for example through the interchange of senior registrars and through the stimulation of reserach in regional hospitals by the new Clinical Research Board.

What may be regarded as to some extent a control experiment is in progress in Scotland, where teaching hospitals are administered by regional boards. The College believes that no structural alteration should be contemplated in either country until the two systems have existed side by side for ten or twenty years, by which time it should be easier to judge their comparative merits.

Unification under Regional Authorities

Proposals have been made for uniting the three branches of the service (hospitals, general practice, and public health) under regional authorities (partially or wholly elected). Such unification might look good on paper yet do little to help patients; and its possible advantages in practice cannot usefully be assessed until the present organisation has had full trial.

"Efficient Use"

"Value for money" depends in the first place on wise apportionment of the resources of the service between its constituent parts, which ought to be developed in relation to one another. In the first five years decisions on policy have too often been made piecemeal. The general guidance which doctors expected the Central Health Services Council to offer has seldom been forthcoming.

Public Health

If the nation's needs were considered deliberately and as a whole it might be found that what is called the National Health Service could profitably devote more of its funds to public health—perhaps embracing occupational medicine, which is now outside its scope. In the long run such expenditure might reduce the demand on the curative services, which have to deal expensively with many illnesses that could be prevented.

† This and subsequent passages which we have for convenience printed in smaller type were not so printed in the report as submitted by the College to the Committee.—ED. L.

General Practice

The most costly form of medical care is that given in hospitals, and money would be saved if some of the cases now investigated and treated in hospital were investigated and treated by the general practitioner.

In the technical revolution in medicine general practice has lagged behind. With the rise of specialism, the scope of the work undertaken by the average practitioner has steadily narrowed, and the public has come to believe that all but the most trivial ailments need the attention of a specialist. Since 1948, when consultations with the practitioner became free, the number of patients going to him has risen and he has often responded by sending more of them to hospital. Yet the introduction of various new and effective remedies has made it possible for him—given the time and the will—to treat more patients in their homes or in general-practitioner hospitals of a simple kind. The Danckwerts award should lead to an increase in the number of practitioners, to a reduction in the size of their lists, and consequently to a better opportunity to practise as a doctor rather than a disposal agent. In many areas the practitioner already has direct access to pathological and radiological departments, which helps him to make his own diagnosis; but he also needs beds for the care of minor illnesses (with specialist advice at hand where required). The technical level of practice could be further raised if groups of doctors prepared to offer an improved service were offered loans or grants enabling them to obtain good premises where they could work, as a team, with first-rate equipment and with nursing and secretarial assistance.

Better general practice, closer contact between practitioner and specialist, and the greater use of the district nurse and the health visitors and home helps supplied by local authorities, would reduce total costs by preventing many patients from going to hospital and by allowing others to be discharged sooner to their homes.

Hospitals

Use of beds.—Latterly there have been great efforts to make the best use of hospital beds. A higher turnover can be attained partly by internal efficiency and partly by providing hospital annexes, recovery homes, homes for the aged and the chronic sick, and hostels to which patients can be discharged. But so long as there are people still waiting for every bed which becomes vacant, a higher turnover, however desirable for the sake of the public, will certainly not lessen the cost of the hospitals.

Pay-beds.—The College is strongly of opinion that hospital care should remain free to all who need it; but this ought not to mean that those who want to pay for a private room with private medical attention should be penalised by having to pay more than it costs the hospital. Many potential paying patients are now deterred by the unnecessarily high charges made, and accordingly enter the ordinary beds of the hospitals where they are treated free. If pay-beds were regarded as an ordinary business proposition, the service would surely encourage, rather than discourage, people who want to pay for themselves.

Personal responsibility.—In a hospital service financial efficiency can never be secured by centrally issued instructions, and it is important that the head of each department should feel personally responsible for the expenditure of that department. The introduction of departmental costing will help to bring this home.

Throughout the service it would be useful if staff of all kinds were given a fair idea of the cost of the materials they use, the investigations they order, and the reports they ask for. At present, unfortunately, many people take little interest in saving what they vaguely regard as "State" money; but their attitude towards waste would be different if it became possible to show that their own institution would directly gain by their carefulness.

Ambulances

Observation suggests that if ambulances were controlled by the hospitals instead of the local authorities, their journeys would be fewer and their staff could be better employed in the intervals.

The Drug Bill

Much money is being wasted on drugs, but all the more drastic remedies for this evil are open to serious objection. The College approves of the Ministry's effort to provide all members of the profession (including senior medical students) with information about remedies and their cost, and hopes that all parties will take active steps to discourage the public demand for the unnecessary bottle and tablet.

Whole-time Service?

General practice.—A whole-time salaried service would make it easier for practitioners to refuse unreasonable demands by patients; but the consequent saving of money on drugs would be offset by disadvantages. The remuneration of nearly all practitioners almost wholly by capitation fee is a sufficient innovation for the time being, and until its merits and demerits have been proved by many years' trial the profession will oppose any fresh experiment.

Specialists.—Some money might be saved by making all consultant appointments full-time. The possible saving is difficult to gauge, but the College does not believe that it would amount to much. Again, a long period of time would have to elapse before such a change could be made.

More important is the harm that might be done to the service through this alteration in policy.

Medical or surgical practice in a large hospital, with the aid of registrars and housemen, is quite different from medical practice more or less single-handed, or with the aid of a practitioner, in the patient's home, in which responsibility cannot be shared and the consultant gets to know the patient as a person. Senior consultants commonly believe that private practice has provided a discipline and experience which they could never have gained in hospital, and they look with apprehension towards a system in which the young physician or surgeon may lose alike in self-assurance, in understanding, in humanity, through having always worked within four walls as one of a large team aiming at a high turnover.

Whether a consultant gives more or less than he receives does not in fact depend on whether he is full-time or part-time but on the man himself. Examples of shortcoming, and also examples of outstanding success, can be found both among full-time and among part-time staff. If the part-timer can sometimes be accused of excessive interest in his private practice, the full-timer can sometimes be accused of deficient interest in anything except his leisure—a fault even graver. After further experience it may be possible to form opinions on the relative value of the two systems, now more or less flourishing side by side.

There is one other consideration to which many doctors would attach even greater weight. Medicine is unique in its scope, since it has to concern itself with the welfare of body and mind, and, in the modern world, every citizen, in health and even more in sickness, is increasingly brought into relation with the State. The independence of the medical profession is therefore of fundamental importance to every individual, and there is a widespread fear that, if almost all doctors were to become whole-time servants of the State, the traditional independence of the medical profession would be seriously compromised, and our society would have lost an asset, the value of which cannot be estimated in economic terms.

"An Adequate Service"

In discussing the future of the N.H.S. it is generally agreed

(1) That, as medicine grows more complex, and undertakes more and more difficult cures, doctors will go on asking for more and more money for their work.

(2) That neither this nor any other country can afford a perfect curative medical service.

Nevertheless the word "adequate" strikes chill because it suggests a dead level of uniformity in which medical

progress itself must die. Clearly, in a service committed to providing medical care for everybody, the standard reached must be "adequate" throughout; but this is not enough. In some at least of its institutions the N.H.S. must afford conditions in which medicine at the most advanced level can be practised. Otherwise British medicine will be quickly deprived of the remarkable position of leadership it has gained during and since the war, and will go into a slow decline until even adequacy will be unattainable.

As things stand, even the hospitals are not yet by any means consistently adequate.

When they were taken over in 1948 they were at all stages of development, and in many areas the services provided in the local-authority hospitals and in some of the smaller voluntary hospitals were indeed primitive. Though some had been improved during the war, the normal development of hospital work had been arrested for seven years, and there was much leeway to be made up. In its first five years, the N.H.S. has also had to contend with a big increase in public demands on the hospitals—because of the greater pressure on practitioners, because people have been encouraged to seek investigation of their symptoms early and often, because many have had no room in which to be ill at home or nobody to look after them, because the proportion of old people is rising, and perhaps because of a decline in the sense of family responsibility. Parallel with this increase in demand, there has been an increase in the complexity of medical techniques, which, though they often shorten illness or save life, has made much new work for the doctors and nurses.

The additional strain on the hospitals has been met partly by an increase in the number of registrars, which has enabled more outpatients to be seen, more operations to be performed, and a quicker turnover of patients to be achieved. Also more nurses have been recruited, more beds have been brought into use, and secretarial help has been improved. In many hospitals, however, sheer physical limitation of space still greatly curtails services required by the public. Too many examples can still be seen of waste caused by failure to spend money on some necessary development. Some of these are obvious—e.g., the extravagance (sometimes of course inevitable) of failing to modernise an antiquated heating system using much fuel and labour. But others less in evidence are at least as serious. For instance, if the radiological or pathological department of a hospital is not enlarged to cope with its work, it forms a bottleneck, and patients uselessly occupy beds for additional days before their turn comes for investigation. In other cases inefficiency which causes no expense to the hospital service may be expensive to the rest of the community—as witness the great loss of working time every day through people waiting in outpatient departments.

With the need to "make do and mend," great benefit has come from small expenditure in brightening buildings, modernising wards, improving equipment, and stimulating efficiency. It is remarkable, in fact, how much has been done with the modest sum devoted to capital works since the service started. Though used almost entirely for repairs, minor reconstruction and extension, and improvement of catering and staff amenities, the £35 million spent in the five years 1948–53 has paid a large if intangible dividend by increasing the turnover of patients, by attracting girls to nursing, and by supporting morale. With the bigger turnover and a lessening of demand for hospital care in certain directions (e.g., for children), there is reason to think that, at any rate in some regions, the number of beds (though not necessarily their quality) may already be adequate. Nevertheless, a sum at least two or three times what has already been spent is required to complete the necessary reconditioning and reconstruction of existing hospitals.

Before anything approaching adequacy can be claimed, much more will have to be done for the mental hospitals and institutions for mental defectives. It is generally admitted that the standard of provision for the mentally sick and mentally deficient is far below the standard of other social provisions. The debate in the House of Commons on Nov. 12 yielded examples of the truly shocking conditions under which some mental patients are still treated; and a dangerous situation is arising in which the supply of mental nurses, on whom these institutions of course depend, is beginning to dry up. The vicious spiral of "bad conditions—smaller staff—worse conditions" is coming into operation.

Apart from expenditure on reconditioning, the time is near when a few entirely new hospitals will have to be built for areas which have become populous—often densely populous—since hospital building ceased in this country before the late war.

Finally, if England is indeed to remain a world focus of medicine, it will soon be necessary to put some of the main teaching centres into the new quarters so many of them have so long desired. In London some require re-siting because of the movement of population.

"A Rising Charge"

As the physical conditions of much of the work of the N.H.S., both in hospitals and elsewhere, fall short of adequacy, the College trusts that no means will be sought for preventing, during the next few years, a rise in expenditure on capital projects.

The question whether—if income and prices remained stable—an adequate service could be kept going on the sum now allocated to maintenance is less easily answered. In the opinion of the College, money would be saved by restoring inducements to economy, in the way it has suggested; and money would also be saved by bringing more buildings and equipment up to date. But the higher annual expenditure needed merely to put the care of mental patients on a level comparable with the care of other patients would more than offset any saving that economy or better buildings could conceivably achieve. Moreover there are other parts of the N.H.S., including the establishment of consultants and specialists, in which the College believes that adequacy has not yet been attained. Hence, even if incomes and prices remained stable, a larger annual sum is likely to be needed for maintenance.

Should incomes and prices continue their upward course, the answer to the question will be plainly No. To go on keeping the financial resources of the N.H.S. stationary while its expenses rise will be to depress the level of its work, which, as has been indicated, is at many points not high enough for the proper care of patients—being well below what the public at present expects.

Since a perfect service is impracticable, the nation should decide what proportion of the national income it is prepared to spend on medical care; and the N.H.S. should then be left to do the best it can with this allowance. The economic situation will sometimes lead a Chancellor to discourage (or possibly encourage) capital expenditure, and the service must be prepared for periods when new developments must slow down or cease. On the other hand every effort should be made to protect it from reductions in maintenance income. If the principle were accepted that expenditure on medicine should bear a constant relation to the national income, the N.H.S. could fairly claim that its annual grant should rise as the national income rises.

Within the framework of the Act, positive encouragement could be given to private benefaction. Many people are keen to contribute to the improvement of their local hospital, but they will not do so unless they can be sure that their contribution is used to supplement what is ordinarily provided for the patients. With fuller knowledge of the nature of endowment and amenity funds, local contributions could be substantial; and their amount could be further increased if, as in the United States, income-tax were remitted in respect of such donations. Steps should be taken to remove the impression of potential benefactors and their legal advisers that money can no longer be left to a particular hospital as free money for its sole use.

The Widdicombe File

IX. THE BEST JOB IN THE WORLD?

DEAR BILL,

Thank you for your letter. I sympathise with you. A G.P.'s life during the first three months of the year, with epidemics treading on each other's heels, with long journeys in sleet and mud to outlying villages, can be hell; but in summer it can be idyllic. Your comparison between the thorny path that you are treading at the moment and the bed of roses on which you imagine me to be reclining is very wide of the mark.

* * *

I couldn't describe a typical day in my life, because no day is typical. A surgeon's chief jobs are to examine patients and advise on their treatment, to operate on those who need operation, to care for them after operation, and to keep in touch with them afterwards for as long as they need supervision. None of these things can be done even approximately to schedule. An outpatient morning may bring a string of straightforward lumps, herniæ, and hydroceles one day, another day a series of difficult problems, where the essential facts must be extracted by insistent questioning from a mass of irrelevant detail poured out in excitable and broken English, where tests must be carried out and laboratory reports and X-ray films must be studied—before it can be decided if the patient must be admitted or can be seen again at the next session.

One sets aside certain times for private consultations; but there may be long periods when the practice seems to have died for ever, other times when for weeks on end patients from every corner are clamouring for appointments, and trunk calls from distant shires and arrivals by air from overseas are threatening to drive an overworked secretary and harassed wife to resignation and divorce. The same uncertainty affects operations. One week nothing but minor routine procedures appear on the list, and of these some fail to turn up, some refuse operation, and some are put off because of a cold. At another time a series of heavy operations lasting three or four hours apiece and making the severest call on one's nerve and physical stamina must be fitted in; and, as luck would have it, the easy operation that has been put in to make the list less onerous presents some unexpected complication that imposes a change of plan, or a ligature slips off a deeply placed artery just as the abdomen is about to be closed and demands urgent action and transfusion, or, at the close of a heavy day when the team and the sisters are dropping with fatigue, the swab count is wrong, and only after repeated hunting round the abdomen and the theatre does the missing bit of gauze appear between the heel and sole of the dresser's rubber boot.

The aftercare of a patient in a nursing-home or at a distance may double the surgeon's work and anxiety for an indefinite period. He is called on an emergency twenty miles away. He finds a man of 65 who has had two coronary attacks and is living carefully. For three days this old man has been feeling off colour, disliking his food but not sick, constipated and blown up, but not in pain. That morning he took a dose of salts. Two hours later he felt a violent pain in the lower part of his abdomen and collapsed. He has been very ill indeed ever since. On examining this old man the surgeon finds that he has general peritonitis. His temperature is just under 100, his pulse-rate is 120, the lower half of his abdomen is rigid, and no peristaltic sounds can be heard. Rectal examination reveals a ballooned rectum. Clearly the aperient burst a localised appendix abscess. The old man is almost certain to die, but the one sure way to kill him is by operating. He requires almost hourly—at any rate twice-daily—supervision for the next ten days. His temperature, pulse, and respiration must be charted two-hourly, and his fluid balance daily. He must be put on intravenous fluids, and the correct amount of fluids; and the balance between crystalloids, plasma, and blood must be continually assessed and adjusted with the help of chloride and serum-protein estimations, hæmatocrit readings, and urine charts, as well as by the appearance of his tongue, the sound of his chest, and the clinical evidence of dehydration. Continuous suction through an indwelling gastric tube must be instituted, and if distension increases it may be necessary to change the Ryle tube for a Miller-Abbott. Morphine is wanted all the time—enough to keep him quiet, not enough to dull his respiratory centre. He must be bullied into moving all the time, or his chest will kill him before his abdomen. His abdomen must be listened to for the first sounds of hope. A daily examination of the belly for the localisation of an abscess in the left iliac fossa, and a daily rectal examination to detect pus pointing in the rectovesical pouch, are equally necessary. For ten days letters are answered in the small hours of the morning and social engagements are scrapped, till a gush of pus per rectum or a fine fanfare of flatus tells the surgeon that he can relax again and return to normal routine.

* * *

All this is fun. All this is in the day's work. But there is a great deal of work that is not fun. There are reports to be made out, letters to be written, testimonials to be composed, references on candidates provided to regional boards, lectures to be given and listened to, journals and books to be read, social functions such as the dinners of hospital societies and corporations to be attended—worst of all, committees of every kind and the profuse agenda that must be digested before each. The more senior a surgeon becomes, the more do his non-clinical duties pile upon him, though his clinical ones remain as heavy. The senior surgeon is a beast of burden who seldom sees a carrot.

I have just looked through my diary for the first six weeks of this year. In that period I spent 460 hours at my job—that is, an average of 11 hours a day, including Sundays. Breaking up this time, I find that 31% only was spent on clinical work, seeing patients and operating; 20% on committees or lectures; 27% on book work or writing (that is, reading in libraries or preparing lectures or articles); 14% in transport (getting from one job to the next), and 7% on surgical-social engagements. Of his work, the 27% spent in reading and writing is far the most exhausting, for it demands the most intense concentration, and it must be done against time, and usually when rest and relaxation would be very welcome.

The distribution of a surgeon's work changes as he gets older, but its quantity increases all the time. He sees as many outpatients, and hopes to see as many private patients, as when he was first appointed to his hospital; but he has more beds and the problems he is asked to advise upon, and the operations he is asked to do, become increasingly onerous. The straightforward jobs go to his junior. The major undertakings, the advanced growths, the third or fourth recurrences, and other people's failures—all these come to him. In addition he is asked to lecture in many places beside his own hospital, and he can no longer rely on the inspiration of the moment as he did as an assistant surgeon, but must spend many hours on preparation. He may be expected to contribute leaders, articles, and chapters, and to write books. He is put on many more committees, and can no longer rely on skimming the agenda while someone else is talking, but must go fully briefed.

On the other hand, he has by now learnt the folly of reading overmuch. A new idea is sometimes good, often rubbish, and usually valuable only when it has been

sifted, assessed, and modified over several years. A new operation can only be judged in conjunction with the status of its propounder, and after seeing it performed by him and studying the patient afterwards. The surgical aspirant who does not read four hours a day will never get through the Fellowship. The surgeon who ten years after certification is still putting other people's ideas into his head for four hours a day has ceased, or will soon cease, to have any of his own. The mature surgeon acquires further knowledge from conversing with his sisters, his students, and his colleagues, and from visiting other centres. If anything worth while has appeared he will hear it, and he will hear it already digested and summarised for his benefit; if he wants to know more, then is the time to turn to the original.

* * *

A surgeon's year consists of 365 days, all entirely different; on some of them he longs to retire, on some of them he is half in love with easeful death, on most of them he glories in having the best job in the world.

Your old friend,

DANIEL WHIDDON.

Parliament

Diesel Exhaust Gases

IN the House of Lords on March 2, Lord LUCAS OF CHILWORTH asked whether the Government would enforce the law on the emission of exhaust gases from diesel engines fitted to road vehicles. The diesel engine was now used in almost all the heavy vehicles on the roads. If the spread continued—and we should soon see diesel engines fitted to private cars—what was now a nuisance would become a menace. In 1950 over 16½ million man-hours were lost to industry because of bronchitis, and one of the causes of bronchitis was probably air pollution. Again the increase in lung cancer was thought to point to some new and potent environmental factor, and atmospheric pollution, in particular from the exhaust fumes of the internal combustion and diesel engines, was a suspect.

Lord LLOYD, joint parliamentary under-secretary of State to the Home Office, thought that on the whole little of the air pollution in towns was due to diesel smoke. According to the report of the Committee on Air Pollution, diesel engines produced 20,000–40,000 tons of sulphur dioxide every year out of the total of 5·3 million tons emitted into the atmosphere. He felt that, at the moment at any rate, diesel smoke did not create a great deal of pollution in the towns. The main places where they emitted clouds of smoke was on the main roads outside the towns. Speaking as one who had often driven behind a lorry, he admitted that diesel smoke could be a menace both to public health and to road safety. At the moment he thought the greatest danger was to road safety.

QUESTION TIME

Part-time Consultants

Dr. BARNETT STROSS asked the Minister of Health how many of the regional boards allowed transfer from whole-time to part-time consultant medical service.—Mr. IAIN MACLEOD replied: All do in suitable cases, subject to the needs of the service. Dr. STROSS: Has the Minister noted that the service is not normally well served, or best served, by men in full-time service transferring to part-time service? Would the Minister give some further thought to, or direction in, this matter? Mr. MACLEOD: I do not think that any such generalisations can be drawn. The policy which I have indicated is based on the 1948 circular, and there has been no change in that. I believe that a part-time consultant service is a very good thing, and I have certainly no evidence to show that there is any deterioration in the service provided to the people.

Mr. ARTHUR BLENKINSOP: Is the Minister aware that he is giving some encouragement to the transfer from full-time to part-time service? Are not some regional boards offering the maximum number of part-time sessions as an alternative to full-time sessions, to the great detriment of the service and to its added cost?—Mr. MACLEOD: Boards may well interpret circulars—in particular the 1948 circular—in different ways; there are different trends in different regional boards. I have no reason to think, however, that the boards are not applying their general policy to individual cases—which is what matters—in a reasonable manner.

Dr. STROSS: Will the Minister give an estimate of the financial saving that would follow the abolition of the part-time consultant service and its replacement by a service employing only full-time specialists?—Mr. MACLEOD: I do not think the financial effect of such a hypothetical circumstance can possibly be assessed. Dr. STROSS: Is the Minister aware that some of us think that the saving would be considerable? Full-time consultants are not allowed any of the perquisites, such as expense allowances, and so on, that follow part-time service. If there could be a switch-over to full-time service would it not be possible to make that service more attractive even financially?—Mr. MACLEOD: Remuneration of all forms is treated rather differently as between whole-time and part-time specialists; that goes back to the Spens report. The first part of the hon. member's supplementary question is in direct conflict with the 1949 amending Act. Any suggestion of part-time service being abolished would certainly be a breach of faith with the profession. Mr. HASTINGS: Would not the withdrawal of travelling time and expenses payments, which apply only to part-time officers, save a lot of money and give the Minister an opportunity to improve the service in other directions?—Mr. MACLEOD: I understand the point but I do not agree with it.

Mr. BLENKINSOP asked the Minister whether he was aware of the financial advantages enjoyed by part-time specialists employed by hospital authorities in comparison with those employed full-time; and whether he would refer the matter to the Guillebaud committee in view of the heavy cost of payments for travelling time and domiciliary visits charged by part-time specialists.—Mr. MACLEOD replied: I am aware of the arrangements which were agreed in 1949. It is open to the Guillebaud committee to consider this point, but I do not think it would be appropriate for me to ask them to inquire into particular topics. If there is to be any adjustment in these terms and conditions of service, it is better left in the ordinary way to the Whitley Council, where it can be fully discussed, and is being discussed in connection with the claim before the medical Whitley Council. I think that is a better forum than the Guillebaud committee.

Salaries of Consultants and Specialists

Mrs. JEAN MANN asked the Minister what negotiations were in progress regarding salary-scales of consultants, senior hospital medical officers, and registrars.—Mr. MACLEOD replied: A claim for higher salaries is before the medical Whitley Council. This matter has been under consideration for 16 or 17 months, a very long time indeed, but I think we are now nearing a conclusion. This is a matter of profound importance which will have repercussions in many other fields.

Retrenchment in Plymouth

Mr. M. M. FOOT asked the Minister what cuts in services he expected the Plymouth, South Devon, and East Cornwall Hospital Management Committee would have to make as a result of the money allocated for 1954–55 by the regional hospital board.—Mr. MACLEOD: I understand that the board is considering with the committee the possibility of closing two units which are not fully used, but it does not at present appear that there need be any reduction in adequate services.—Mr. FOOT: Is the Minister aware that when he talks about two units not fully used, what he really means is that his policy is to compel the Plymouth board and the area management committee to close down two maternity hospitals and another hospital which have been part of the expansion campaign over the last few years? Indeed, he is compelling the management committee in this area to reverse the policy of previous years and to cut down the hospital services in the whole area.—Mr. MACLEOD: I do not accept that for one moment. The allocation to this hospital management committee, as I said before, has, in fact, gone up and not down. The first reaction of Mr. Medland, the chairman, was to say that he would be compelled to close two maternity homes, a training-school, and a hospital for the chronic sick. If that is the reaction to an offer to increase moneys we must look very carefully into the administration there.—Mr. FOOT: Would the Minister take into account that Mr. Medland has had the full support of his management committee in stating that the

amount of money allocated was exactly the same as last year and took no account of the increase of £25,000 which had to go to meet extra charges, partly for salaries ?—Mr. MACLEOD : This matter is one that should be discussed by the regional board and the management committee. It is far better that it should be done that way rather than to hold Press conferences or to make statements in *Tribune*, as was done for another purpose.

Human Infection from Fowl Pest

Mr. D. G. BULLARD asked the Minister of Health if his attention had been drawn to the danger that four men in Norfolk might have contracted fowl pest after helping with the slaughter of chickens among which the disease had broken out.—Miss PATRICIA HORNSBY-SMITH replied : The Minister is advised that this disease, although in a limited sense transmissible to man, is not readily passed on among human beings. The only known clinical form of the disease in man is a mild inflammation of the eyes without constitutional disturbance. In the instance referred to the men are now back at work. While it is not unreasonable to attribute the eye condition of these men to contact at work with the diseased fowls, the laboratory tests made did not confirm this association.

Grants to Universities

Mr. G. THOMAS asked the Chancellor of the Exchequer what steps he proposed to take to control the expenditure of the £110 million which he has promised to find for the universities during the period 1952–57.—Mr. R. A. BUTLER replied : It has for many years been an essential feature of the relationship between the universities and successive Governments that the Treasury has sought to avoid detailed control of the activities of the universities. I do not propose to depart from this policy.—Mr. THOMAS : While this has been the custom through the years, does not the Chancellor believe that public control should be exerted where public expenditure is involved? It is a lot of money. Mr. BUTLER : I think there is a rather well-established understanding between the parties that the work of the University Grants Committee in disseminating this money and caring for the needs of the universities is beyond reproach. I would rather leave this matter to that committee's care.

Anti-hæmophilia Globulin

Mrs. MANN asked the Minister of Health if antihæmophilia globulin was available for emergency treatment to patients in hospitals who were hæmophilics.—Mr. MACLEOD replied : A limited supply is available on application by doctors, but its efficacy is still the subject of research and is not yet established. Application should be made to the Lister Institute, Chelsea, or to the appropriate blood-transfusion centre.

Secondment to Colonial Medical Service

Mr. JOHN TILNEY asked the Secretary of State for the Colonies what arrangements there were for seconding doctors from the National Health Service to the service of Colonial governments ; and how many were seconded to Nigeria and the Gold Coast, respectively.—Mr. J. G. FOSTER replied : Hospital authorities have power to second members of their medical staffs to overseas and other posts. In addition N.H.S. hospital doctors may take up employment in the Colonial Medical Service for periods up to six years, with continuing participation in N.H.S. superannuation. The salaries and general conditions of service of doctors so employed are similar to those for doctors on the permanent establishment. On reversion to employment in this country, a gratuity is payable. 1 doctor is serving in Nigeria and 3 doctors in the Gold Coast under these arrangements.

Mr. TILNEY : Will the Minister bear in mind that in Northern Nigeria there is only 1 doctor for every 64,000 people, and would he discuss with the Minister of Health what steps can be taken to make seconding better known and more popular ? Mr. FOSTER : The trouble is partly due to the recent creation of the posts and partly to reluctance to accept a new idea.

Public Health

Paratyphoid in Cardiff

THERE has been an outbreak of paratyphoid in the Cardiff area and so far about 30 cases have been notified. The source of the infection has been identified and the necessary measures for its control have been taken.

Population Estimates

The Registrar-General has issued his estimates [1] of the populations of counties, boroughs, and urban and rural districts in England and Wales on June 30, 1953. Grouped figures are given for the standard regions and conurbations, and density aggregates by sex and age for the country as a whole. These details will, it is hoped, meet a general demand for an early issue of up-to-date figures of local populations, which are a help to local authorities, manufacturers, and distributors. The population of England and Wales on June 30 last year is estimated at 44,090,000—an increase of 150,000 over the figure for mid-1952.

"A Municipal Hospital Service"

The *Municipal Journal* has expressed the conviction that " the transfer of all hospitals to local government would bring a saving in money, and other important advantages." [2] This transfer, the journal suggests, would curtail administrative costs ; it would bring the hospitals under democratic control ; and the ordinary machinery of local-government finance could then be applied to them.

" Money for capital works could be borrowed and hospital managements would be able to plan ahead. The revenue expenditure would add to the rates, but a large proportion could be met by grant. The increase in money raised by rates would in any case be balanced by a decrease in that raised by taxes."

Such a transfer, says the *Municipal Journal*, would ensure for the public a better and much more comprehensive service. It would forge the essential link between the personal and the environmental sections. The attempt to coördinate all National Health Service functions by local and regional committees had failed.

Commenting on this proposal, Prof. R. H. Parry, medical officer of health for Bristol, declared : " I firmly believe that we should get far better results for the same amount of money if the whole organisation was placed under the city council." [3] He cited the present scattered responsibility for the treatment and prevention of tuberculosis as one instance of the need for radical alteration. Again, the outpatient departments of hospitals were out of tune with the conditions of today. Professor Parry was opposed to development of large outpatient departments. General practitioners were quite capable, if given the facilities, of diagnosing and treating cases : what they needed was diagnostic centres on the housing estates. The day-to-day management of hospitals should be placed in the hands of medical superintendents.

1. The Registrar-General's Estimates of the Population of England and Wales. H.M. Stationery Office. 6*d*.
2. *Municipal Journal*, Feb. 19, 1954, p. 345.
3. *Western Daily Press*, Feb. 25, 1954.

Infectious Diseases in England and Wales

Disease	Week ended February			
	6	13	20	27*
Diphtheria	19	11	19	11
Dysentery	624	669	754	910
Encephalitis :				
Infective	3	1	3	1
Postinfectious	1	2	—	1
Food-poisoning	88	109	224	160
Measles, excluding rubella	1487	1846	1945	2099
Meningococcal infection	33	40	51	49
Ophthalmia neonatorum	25	27	20	36
Paratyphoid fever	4	4	10	5
Pneumonia, primary or influenzal	826	932	934	869
Poliomyelitis :				
Paralytic	17	15	15	17
Non-paralytic	4	6	4	7
Puerperal pyrexia	235	280	225	293
Scarlet fever	1015	1162	1225	1463
Smallpox	—	—	—	—
Tuberculosis :				
Respiratory	825	787	793	841
Meninges and C.N.S.	17	17	20	19
Other	94	100	107	106
Typhoid fever	—	—	1	3
Whooping-cough	1984	1918	2099	2098

*Not including late returns.

In England Now

A Running Commentary by Peripatetic Correspondents

I ENJOYED Heinrich Harrer's *Seven Years in Tibet*, and I was proud to find that the Tibetans "did not carry the men wounded in this accident to their Lamas, but to the British Legation, where there was a hospital with a number of beds for Tibetans. The English doctor had plenty of work. Every morning there was a queue of clients waiting at his door, and in the afternoon he visited his patients in the town. The monks tolerated in silence this intrusion into their territory. They could hardly do otherwise, because it was impossible to ignore the doctor's success." After this, what a disappointment to read: "Our life continued peacefully. Summer approached. My sciatica got better and nothing was said about our expulsion. I was receiving regular treatment from the English doctor, but on fine days I was able to work in the garden." *But*, Herr Harrer? Do you not know that the whole aim of the English practitioner is to get his patient to work in the garden at the weekend, sciatica or no sciatica, fine weather or bad? Candide's conclusion is our national philosophy, and Tibet is not the only place with a rockery. Why, if you would come down next Saturday to our little place, Shang-ri-la it's called. . . .

* * *

One of the pleasures of our after-lunch strolls is to study the strange businesses conducted within walking distance of the laboratory. As pathologists we are naturally attracted by a business carried on by a number of grave-faced men in a large yard. It is a car-breakers', and it arouses in us a nostalgia for the autopsy-room. Do the car-breakers, we wonder, approach the derelict with scepticism for the clinical diagnosis? We imagine, too, their delight over some rare anomaly of the transmission, the short note sent to a journal on a hitherto unrecognised disease of the cam-shaft. Surely the foreman breaker is engaged on one of those mammoth statistical reviews of a life-time—the cause of failure in 20,000 consecutive post-breakdowns.

But perhaps it is not really a pathological establishment, but more in the nature of a department of anatomy, where apprentice mechanics spend a year as demonstrators before tackling real operative vehicles, and where the prize pupil's painstaking dissection of the back axle of a 1925 Bean is preserved for ever in oil. There is even analogy from human practice, for the notice over the gate runs, "Used spares for sale."

* * *

Relations between the police and the medical profession are at once amiable and delicate. Each regards the other, and itself, as a race set slightly apart from the common herd; as observers of, rather than participants in, the comedy of life.

This delightful relationship remained unimpaired some time ago when we had our wallet stolen. We were impressed when the police appeared within ten minutes of our SOS, and so bemused that we were regarded as worth a superintendent, no less, that it was some time before we noticed that he didn't actually recover our property. We gazed affectionately upon him as he knocked back our pale ale, for we had read our Agatha Christie and our Ngaio Marsh, and one thing we were sure of was that the Force never drinks with suspicious characters. "Have another," we said warmly, and reflected smugly that these chaps really knew their job and could recognise a respectable, God-fearing, law-abiding citizen when they saw one.

Our fall was bound to come, of course, though we had to wait a bit for it. We were driving placidly along the road one December evening when our calm was rudely shattered. Horns tooted, gongs gonged, and large red lights reading "POLICE. STOP" were flashed at us. The Arm of the Law wore the most velvet of gloves. Did we know, it inquired courteously, that we had entered a built-up area at 45 M.P.H. and had been doing 31 when we came out of it? We said No, that our car was fifteen years old, and hadn't done 45 at all since we had taken nine people home in it from a party in 1944. The Arm just gazed at us with lambent eyes. Half of it got out a little book and began to lick its pencil, and the other half decided to clinch its case. It produced a nasty little tape-measure and after a moment told us pleasantly that our fog lamp was six inches too near the ground. We remarked rather feebly that our tyres were a bit flat, but that did not impress anyone, and all we got was an indulgent smile.

The Law took its course; but a month after we had appeared before the magistrates the now too familiar face of the Arm presented itself at our outpatients. Looking a bit sheepish it said that it coughed and had a pain in its chest. Gravely we placed the icy mouth of our stethoscope to its chest; we made it repeat 99 many times, and each time we said things like "Mm" and "Aaah," and once "Ahaa . . . interesting . . . mmm." When it told us it had smoked five cigarettes a day regularly for the past six years, we shook our head sadly. But our real moment came when we looked searchingly at the blameless X ray on our viewing-box; we kept absolutely quiet for a good five minutes, and then made sad clicking noises with our tongue before we gave the Arm a modest bottle of linctus, and told him that he had a touch of the bronchitis and had better have a day or two in bed.

* * *

With a White Coat, the first difficulty is to Get the Cycle Started. You present yourself at the linen-room and establish your identity. "So you are succeeding Dr. Denmark. He was much taller than you. I expect his white coats won't fit you." They don't. I have gained the impression that I always succeed muscular acromegalics or anthropoid achondroplasics, but I am told this is statistically unlikely. A white coat which approximately fits you is eventually produced. "You have such short arms, Doctor." It's never the coat that's at fault.

Once acquired, the coat has still to be donned. I advise those who plot their morning time-tables carefully to allow ten minutes to change a white coat. To begin with, it is well starched, and when you succeed in unfolding it and turning it right side out you will find the sleeves firmly welded together. Even when you are safely inside, your possessions have still to be settled. Stethoscope, the diary, letters, consultation forms, blue and red pens, pencil, and torch await their new home. It only remains to take a nail-file, prise open the starch-soldered ridge of the pocket, and allow your belongings to drop through the convenient slit at the bottom straight to the floor.

* * *

When Bertie the Burglar was X-rayed for swallowed valuables and found to have tuberculosis as well, he was transferred to our hospital. His arrival made quite a stir in the reception office before we had completed his admission form. The diverse items, ranging from Religion to Consent for Post Mortem, were all filled in, but the space headed Occupation still showed a conspicuous blank, and a protracted argument ensued.

All were agreed that to enter "burglar" was to prejudice the likelihood of reform. Likewise "prisoner," "convict," or "jailbird" denoted pessimism in the corrective possibilities of our penal system. Nondescript terms such as "labourer" or "odd-job man" were discarded so as to avoid undesirable litigation with the appropriate unions. "Unemployed" seemed likely to cause later difficulty over unemployment benefit; nor could anyone who was serving a sentence be truly described as "out of work." Inspiration came from our junior clerk, who suggested "bugler" (deliberate mistake like they do on the television, see?), but the general reaction was that any misspelling of the word was dangerous and liable to abuse. Suggestions that "income-tax inspector," "garage proprietor," "barrow-boy" were all synonyms for robber were dismissed. In view of determined opposition from the occupational therapist, "stonemason" and "mailbag manufacturer" were also abandoned. The compromise finally agreed upon was "self-employed."

* * *

"Three years ago I had Zebra-Ears." I was still thinking hard about this rare tropical-sounding disease when my house-physician whispered "seborrhœa."

Letters to the Editor

PATIENT'S CONSENT

SIR,—I should like to compliment Dr. C. H. Neville-Smith (March 6) on his timely warning to your readers to refrain from accepting as a reliable legal dictum the statement of a hospital management committee that "if a patient comes to hospital either on a doctor's advice or on his own initiative, he is deemed to agree to receive treatment."

It cannot be said too strongly that, in the absence of statutory authority, a doctor is not at liberty to conduct a medical examination, or to administer treatment, in the absence of the valid consent of the patient—disregarding, of course, patients who are unconscious or otherwise incompetent to give consent to the proposed procedure to whom other considerations apply.

Furthermore, the consent must not be acquired by a trick. It must be full, free, and valid in all respects. To secure a valid consent it is necessary for the practitioner to make known to the patient what he proposes to do, or what he recommends as treatment for the condition from which the patient is suffering. That explanation should be put forward in terms that the patient is able to understand so that he can weigh the matter for himself and decide accordingly. To assume, as the authors of the statement appear to do, that the arrival of a patient at a hospital is sound legal evidence that that patient is ready and willing to submit to any form of medical examination, or hospital procedure, recommended for the alleviation of his condition would be to invite grave legal trouble. Subsequently, the patient might appear in legal proceedings seeking to show that he had suffered a trespass at the hands of a hospital practitioner who had done something of a medical order for which valid consent had not been sought and obtained.

For some time past hospitals have recognised this legal pitfall and have used printed forms of consent for presentation to and signature by a patient who is advised to undergo a medical or surgical procedure associated with varying degrees of risk. The organisation I serve continues to make available to its members, upon request, model forms of consent and a useful memorandum dealing with the medicolegal aspects of the problem involved.

Medical Defence Union,
Tavistock House South,
Tavistock Square,
London, W.C.1.

ROBT. FORBES
Secretary.

SALARIES OF WHOLE-TIME SPECIALISTS

SIR,—May I reply to some of the points raised by your correspondents? Senior hospital medical officers were not included in my estimate that a third of the consultant work was done by whole-time specialists, but if they are the proportion is unaltered. There are 1908 part-time and 886 whole-time S.H.M.O.s.

All agree that the refusal to pay the whole-timer for domiciliary visits makes general practitioners reluctant to call him out, which is to the detriment of patient, general practitioner, and consultant alike. It often results in the needless admission of patients; and a general hospital bed costs £14 a week.

There are 15 part-time consultants and 1 whole-time regional consultant on the staff side of Whitley "B," and on the joint committee, whereas in equity there should be at least 5 or 6 whole-time representatives. Both committees (see Mr. Coates's letter of Feb. 20) have always looked after the interests of part-timers, even when it meant sacrificing those of whole-timers, as in the mileage-allowance negotiations. As Dr. Baker (Feb. 27) points out, there is no logical reason why a specialist doing 9 sessions a week instead of 11 should receive extra travelling allowances and up to £840 a year for domiciliary visits. The Spens recommendation was that the part-timer doing 9 sessions should be paid for $9^1/_2$, and the whole-timer for 11; in other respects, they should be paid alike.

If justice is to be done to *all* whole-timers, the Spens report must be implemented fully. Admittedly the major item is the "betterment factor," and as the cost of living has risen by 29% since 1948, our present one of 20% leaves us 9% worse off than in 1948. It may not be politically expedient to give us the other 80% at once, but it could be done in stages. There is, of course, no justification for refusing to implement the other provisions of the Spens report, about payment of whole-timers for domiciliary visits and "expenses reasonably incurred in the course of their work," forthwith.

As justice has been done to the general practitioner and (apart from the 1000 short-list men) he earns an average of over £3000 a year, of which 38% is allowed, for tax purposes, as practice expenses, young doctors will be attracted into general practice. Unless the salary scale for whole-time hospital staff—from junior houseman to consultant—is substantially raised, the acute shortage of junior medical staff in non-teaching hospitals will increase.

Unity amongst specialists is not fostered by insinuations about the work done by whole-time and part-time staff. In particular the following extract from the memorandum submitted to the Guillebaud Committee by the Royal College of Physicians is hardly in its best tradition: "If the part-timer can sometimes be accused of excessive interest in his private practice, the full-timer can sometimes be accused of deficient interest in anything except his leisure—a fault even graver." If the representatives of this college and the other members of Whitley "B" hold the view expressed, can they justly claim to represent whole-timers' interests? Perhaps the management side is not entirely to blame for the fact that no concessions have been secured for whole-timers? The critics of whole-time service should remember these facts. As Mr. Murley (Feb. 13) points out, sessions were allocated arbitrarily to both whole-timers and part-timers, and the joint committee has had a struggle with the Ministry to prevent some part-timers losing their "surplus" sessions. It would be hard to devise terms which offered whole-timers less incentive in the form of expense allowances, payment for domiciliary visits, and income-tax reliefs than the present ones. And who is to blame, seeing that whole-timers were excluded from the negotiating committee until quite recently?

What can be done? Whole-timers must press for adequate representation on the staff side of Whitley "B." They should write to their M.P.s and have questions asked in the House about the matters discussed. The more public support we can enlist for our cause the more likely we are to obtain justice, and the standard of whole-time service is of vital importance to every patient who cannot afford private treatment. The question of refusing to use our cars and telephones on official business, unless we are adequately recompensed for doing so or granted income-tax relief on our expenses, must be considered. If all else fails, we must remember that general practitioners secured the Danckwerts award because they threatened to withdraw from the service. What do your readers think?

Orpington,
Kent.

LEO GILCHRIST.

SIR,—Dr. Leaming (Feb. 27) has sounded a timely note of warning to all hospital medical staffs.

There are many grave injustices to whole-time specialists but these are dwarfed by the injustice to all specialists of the present pitiful betterment factor. Since 1948, successive Ministers have all applied the same highly successful policy of "divide and rule." Is it not time that the profession united and called a halt to this insidious process? Our representatives on Whitley

Councils and other bodies might then be able to make effectual representations to the Minister.

I should like to add that I am a whole-time consultant.

Bracebridge Heath Hospital, near Lincoln. F. A. BLEADEN.

SHORTAGE OF HOSPITAL BEDS

SIR,—A daily newspaper published recently a leading article pointing out that the strain upon British hospitals has reached a dangerous point. The paper suggests that the shortage of hospital accommodation must be met by economies, reorganisation, and reallocation of funds, or by the provision of more buildings containing more beds, staff, and equipment.

I think the emphasis should be placed on reorganisation and reallocation of funds. The turnover of patients in hospital beds for acute cases can undoubtedly be greatly increased and many hospital beds thus made available. Approximately 10–15% of acute beds are occupied by the chronic sick and by old people requiring care and attention only. New buildings of the pavilion type are required to accommodate these patients. They could be constructed much more cheaply than modern hospitals. Active geriatric and rehabilitation departments should be closely associated with these centres, and this again would free many beds in acute hospitals. There are sites in the grounds of many hospitals on which such buildings could be erected.

There are some hospitals with long waiting-lists working under great pressure, whereas a neighbouring hospital has not to face the same demands for its services. Coöperation and coördination is the obvious answer to this problem.

The shortage of hospital accommodation in many parts of the country could, therefore, be largely met without building new and expensive hospitals.

Wanstead, London, E.11. ERIC FRANKEL.

CONGENITAL PNEUMONIA

SIR,—Your annotation of March 6 expresses the general belief that congenital pneumonia is the result of the inhalation of infected liquor amnii in utero. Doubtless some cases are the result of this but they must not be accepted as proved unless undoubted elements from the liquor are demonstrated in the pneumonic patches. In some babies dying within a day or so of birth the grey hepatisation is found confined to the regions where inhaled squames are abundant. These inhaled squames are not necessarily from the liquor; they may be from masses desquamated in the oropharynx of the baby.

I am unable to accept the time of six hours after birth as proving that the pneumonia is congenital. An examination of the lungs of those dying within an hour or two of a motor accident will often give proof that alveoli can fill with polymorphs (grey hepatisation) in a very short time. For this reason I reject every pneumonia as congenital in a baby born alive unless there is some lesion, such as a fibrinous pleurisy, which could not possibly have developed in the time. By this standard I found pneumonia in roughly 1 in 8 of the stillbirths, and 1 in 3 of the live births; in the live births I only accepted 1 as definitely congenital. Doubtless many observers would have accepted more than this, but I did not see the proof.

It seems to me quite certain that an important proportion of cases of pneumonia developing in utero are the result of infection of the fœtus from the maternal circulation via the placenta. Two conditions in the mother are especially liable to be associated with positive blood-cultures—respiratory infections and pyelitis. Before the late war, when potent antibiotics were not available, it was quite common to diagnose pneumonia by finding pneumococci in the blood-cultures from cases of pyrexia of unknown origin. This common lesson from the past is not likely to enter the experience of younger pathologists, but they must realise that, in the untreated disease, pneumococci are to be expected in the mother's blood and can pass the placental barrier. The 1 congenital pneumonia in a live birth that I did accept had a fully developed fibrinous pleurisy. I learned that the mother had had an attack of "influenza" one week before delivery, and I think the fœtus was infected then.

Pneumonia developing in utero may kill the fœtus and so be the cause of an abortion. I think it quite likely that this is the reason for upwards of one-eighth of abortions. With Dr. D. M. D. Evans, I have recently seen a very interesting example of this. A mother who had lost her first baby had pyelitis when 16-weeks pregnant. She aborted at 18 weeks. The fœtus was sent to us to see if we could explain the abortion. It was not autolysed. Although the alveoli had not yet differentiated, there was a perfectly developed bilateral pneumonia. The organisms were coliforms and enterococci, and almost certainly came from the mother's blood when she had pyelitis.

Derbyshire Royal Infirmary, Derby. G. R. OSBORN.

POLIOMYELITIS IN CHILDREN'S WARDS

SIR,—I would like to congratulate Dr. Stanley Banks on his letter of Feb. 27. The time is running short before we enter the season of poliomyelitis and it seems pertinent that the danger of treating acute poliomyelitis in the wards of general hospitals is clearly understood. Nevertheless, it is not this part of Dr. Banks's letter upon which I venture to comment but on his remark that paralysis was preceded in all the 6 children affected in the legs by a course of penicillin injections in the buttocks and thighs. We have seen similar cases, the more recent of them still in the immediate postparalytic stage at the present moment. A child of two was admitted to a surgical ward to undergo an operation: in the routine investigation streptococci were reported in his throat from the day after the operation and penicillin were injected into the right leg for six days, the left leg having been operated upon. Ten days after operation he became pyrexial and on the fifteenth day it was found that both legs were paralysed. About four weeks from the onset of paralysis, only the right leg was severely affected.

May it be that, as an American colleague stated the other day, the indiscriminate use of penicillin injections in America has something to do with the recent prevalence of the disease there? However this might be, we should not be deterred from controlling the main cause of poliomyelitis epidemics—that is, human contact and its *bête noire*, the human carriers. In the absence of active immunisation, only the control of the contacts seems likely to be effective in reducing the chances of becoming affected.

Nearly fifty years ago Wickman [1] recognised the abortive and meningitic forms of the disease and placed the primary centre of infection in the village school, tracing the contacts that spread the infection from school to village and from one village to another. In spite of this very early evidence and the amount of conclusive data recently provided, we do not seem interested in searching for the virus in the throats and hands of those really responsible. Who can as yet say that a simple method of protecting the nasopharynx from becoming contaminated or of getting rid of the virus would not do the trick? The poliomyelitis virus seems particularly resistant to many antiseptics, but it does not seem able to resist a 2% solution of hydrogen peroxide and also menthol. Perhaps, for the time being at least, some energies should be devoted to the investigation of this pressing problem.

An investigation has been initiated in this centre into the mechanism that enhances the susceptibility to

1. Wickman, I. Beiträge zur Kenntnis der Heine-Medinschen Krankheit. Berlin, 1907.

paralysis after injection of several substances, and we hope to be able to publish some encouraging results before long.

Nuffield Orthopædic Centre, Oxford. J. TRUETA.

TREATMENT OF DEAFNESS

SIR,—I feel it important that everyone interested in deafness, and especially otologists, general practitioners, and the lay hard-of-hearing public, should be careful about accepting unreservedly the claims made by a firm of hearing-aid manufacturers for improved hearing by re-education methods, without hearing-aids.

The claim is made concerning people ranging from the hard-of-hearing (but not requiring an aid) to those with considerable high-tone deafness, and even for some too deaf for an aid to help at all. An increase in the ability to listen is denied; the improvement is attributed to the release of "latent" hearing. This may be so, but the principle needs medical and scientific investigation before the practice is recognised as of true value.

At present, the sponsors assess improvements only with a "live" voice and uncalibrated "complex" sound tests; any change in pure tone audiometry is disclaimed and speech audiometry is not used. The value of the gain in hearing is also gauged by letters from grateful patients and clients, which, though enlightening, are in fact unscientific evidence and all too reminiscent of advertisements for patent medicines or "cures" in the Hunterian era.

IAN ROBIN

London, W.1. Vice-chairman, National Institute for the Deaf.

MYXŒDEMA ATTRIBUTED TO IODIDES

SIR,—The two cases of myxœdema attributed to iodide administration described by Dr. Morgans and Dr. Trotter in your issue of Dec. 26 are of extraordinary interest not only because they would appear to be the first recorded instances but also because they have demonstrated the spontaneity with which the thyroid gland can regain its function in a comparatively short period of time. They referred to a third case reported by Raben, and I wish to describe a further one.

A 62-year-old man consulted me in October, 1953, for weakness, lethargy, coldness, dryness of the skin, puffiness of the eyelids, huskiness of the voice, and thickness of speech—a group of symptoms which had come on gradually in the previous three months. This classical picture of myxœdema was given further confirmation by the finding of a plasma-cholesterol concentration of 384 mg. per 100 ml. and a B.M.R. reading of −20%.

For the previous fifteen months he had been maintained very rigidly on a fat-free, cholesterol-free diet and was given fortnightly intramuscular injections of 5 ml. of 'Lipiodol' on thirty occasions because of a diagnosis of early calcification of the aorta. This régime was adopted following a routine medical examination elsewhere. His plasma-cholesterol reading at that time was 192 mg. per 100 ml., exactly half the later value. Although the presenting symptoms, the greatly increased plasma-cholesterol level, and the diminished B.M.R. were much in favour of a diagnosis of myxœdema, it was decided that it would be of interest to determine the plasma protein-bound iodine concentration because of the lipiodol administration. As was to be expected, this estimation gave the extraordinarily high figure of over 100 μg. per 100 ml.—the true figure being inestimable.

Because of the severity of his symptoms, it was decided to give him gr. $1^1/_2$ dried extract of thyroid twice daily for four days and then once daily subsequently. Within a week there was a dramatic amelioration of all his symptoms, and within a fortnight not only was he symptom-free but his plasma-cholesterol was 210 mg. per 100 ml., and his B.M.R. was +4%.

Unlike the two patients described by Dr. Morgans and Dr. Trotter, this patient was immediately given thyroid extract because of the severity of his symptoms. Moreover, because of the enormous quantities of iodine given over a period of fifteen months, in a medium of poppy-seed oil and in a radio-opaque form, which would keep the protein-bound-iodine plasma levels considerably elevated for many months, it was felt that a spontaneous recovery of thyroid hormone manufacture would take a comparatively long time—at any rate longer than the four to ten days mentioned by Dr. Morgans and Dr. Trotter. As supporting evidence for this supposition, the protein-bound iodine fourteen days after his last injection of lipiodol was still very greatly in excess of 35 μg. per 100 ml., at which level Wolf and Chaikoff found that the thyroid was incapable of converting iodine to di-iodotyrosine and thyroxine. Finally, this patient had been on a fat-free, cholesterol-free diet for fifteen months, so it was considered that this, as pointed out by Selye, was an additional factor in inhibiting the production of thyroid hormone.

Johannesburg. I. FREED.

ORDINARY YOUTHS

SIR,—Dr. Morris (Feb. 27) is not clear what I intended by my remark "precipitately rushing into print," in my letter of Feb. 13. I think the rest of the sentence ("if they had waited for a tenfold increase in the size of their group") makes the meaning quite clear.

Dr. Morris refers to the "more-than-ever puzzling rising generation." Is it any wonder that this impression is abroad when studies like that of Dr. Logan and Miss Goldberg are used as indications of the ways of our young people?

It is true that those engaged in the practice of occupational health are amassing a vast treasure-house of information. At least one group of medical officers in a large industrial organisation, with units throughout the country, are attempting to make an assessment of the material gathered each year. Unfortunately the greater part of industry is composed of small units and any such assessments, to be worth while, and to give a nation-wide picture of our young people, require correlation by a central body. I can think of no-one more suited for this task than Dr. Morris and his research unit.

WILLIAM HUNTER
Medical officer,
Glasgow, C.4. Wm. Collins Sons & Co. Ltd.

HYPERSENSITIVITY TO PENICILLIN

SIR,—Your leading article of Jan. 2 is of great interest to me. I wish to report my experience of a case of anaphylaxis resulting from injections of crystalline penicillin G and streptomycin given together.

The patient, a woman aged 30, was known to have been asthmatic since childhood. She came under my care for treatment of acute bronchitis. I found that she also had a patent interventricular septum (Roger's disease), and I decided to give her an antibiotic as a prophylactic against subacute bacterial endocarditis. Knowing from her past history that she had had a severe urticarial rash after an injection of procaine penicillin in 1952, I thought that injection of ordinary crystalline penicillin G might not be followed by such a reaction. On Dec. 3, 1953, I started her on a course of daily injections of crystalline penicillin G 500,000 units, together with streptomycin sulphate 1 g. The first three injections gave no untoward reaction.

One minute after the fourth injection, which was definitely not into a vein, the patient felt tingling in her throat, giddiness, and a sense of impending death. In a few seconds her eyes bulged, and her tongue was swollen and protruded; generalised cyanosis developed with cold extremities and tachycardia. After another minute she lost consciousness, and examination showed feeble heart sounds and prolonged expiration with a wheeze audible over the upper part of the larynx. I immediately gave her an intramuscular injection of 1 ml. of 1 : 1000 adrenaline solution and 20 ml. of 10% calcium-gluconate solution. She recovered consciousness during the calcium injection, the laryngeal spasm gradually subsided, and cyanosis disappeared completely within ten minutes. For a few hours afterwards she had spasmodic uterine pains with difficulty in initiating micturition. As

soon as she could swallow I gave 'Neo-antergan' (mepyramine maleate) 100 mg. followed by 50 mg. t.d.s. for one week, during which there was a blood-tinged watery vaginal discharge.

The following points seem of interest in this case:

1. The history of bronchial asthma and the presence of Roger's disease.

2. The past history of injections of procaine penicillin 400,000 units daily for thirty days in 1950 for a skin infection, without any reaction whatever.

3. The past history of an urticarial reaction to the twelfth daily injection of the same procaine penicillin in 1952, when this was injected to prevent complications after a difficult labour.

It seems impossible to decide which of the two antibiotics given—crystalline penicillin G or streptomycin sulphate—was responsible for the anaphylactic reaction.

Ibrahim University,
Cairo, Egypt. M. SALIB.

ERYTHEMA INFECTIOSUM

SIR,—Your annotation of Feb. 27 discusses this condition. During the period March 10 to April 9, 1952, seven cases of erythema infectiosum were seen in this village of some 5000 inhabitants. Two boys and five girls were infected. The average age was 6 years 9 months, the youngest being 3 and the oldest 10 years. The patients were widely separated, one living on a farm a mile from the village. Only two were below school age, and both of these had siblings at the village schools. In no instance did siblings contract the disease.

The appearance of the patients was just as described by Harries and Mitman.[1] The county medical officer of health kindly came to see four of the patients, and he confirmed the diagnosis. There was no constitutional upset. The bright red face was the salient feature of the disease, and it was this that brought the patient to the doctor. From start to finish the complaint lasted about five days.

Ibstock, Leicester. C. A. H. WATTS.

SPINAL TRACTION

SIR,—How nice it would be if the problem of disc protrusions were as simple as Dr. Barbor suggests in his article of Feb. 27. It is very convenient to divide cases into watertight compartments, but the syndrome of disc propulsion is infinitely variable and I do not believe there is a sharp dividing-line between annular and pulpy protrusions. Surely, in most patients, there is a gradual degeneration of the disc, punctuated by acute episodes. We often find that patients give a history of several acute attacks and later less acute, but more persistent, attacks. Is this not at first a bulging of the disc, later leading to rupture and full herniation?

There is no doubt at all that traction is a valuable procedure; osteopaths have been using traction tables for over thirty years and obtaining good results without knowing the basis for the results. The table used by Dr. Barbor is, in fact, a modification of a standard osteopathic traction table, which can be used either for static traction or for rhythmical traction. I find that static traction is of most value during the subacute clinical stages and rhythmical traction in chronic low backache, which so often follows acute episodes. I do not find that traction of any sort is of much avail when the protrusion is causing signs and symptoms of nerve-root pressure.

The osteopathic table has a lower section which moves on rollers, and the hip harness is connected to a motor which pulls smoothly and applies traction at the rate of twelve pulls per minute. The amount of traction is governed, not by what the patient can take, but by what his erector spinæ muscles indicate that he can take; in other words, we palpate these muscles during traction and if, at the height of the pull, the erector spinæ contract in spite of the patient's attempt to relax, then the poundage is too heavy and a smaller pull should be exerted.

During the process of rhythmical traction the patient gradually lengthens and continues to do so for 12–15 minutes, after which time there is no further lengthening and it is pointless to continue the treatment. The average increase of height after treatment is $^3/_8$ in. and such increase is not lost until the patient has been up and about for two hours or so. The only explanation I can offer for this increased height is that the discs themselves have become more turgid. It is known that there is a diurnal variation of height of about $^1/_4$ in., the spine increasing in length during the night and decreasing again during the day. It is assumed that there must be an alteration in the fluid content of the discs and that weight-bearing tends to reduce their thickness, while sleep allows them to become more turgid again. If we can increase the disc thickness, which we can do with rhythmical traction, even if only temporarily, it must accelerate fluid interchange between the discs and vertebræ and this will tend to accelerate repair with consequent clinical improvement.

While I cannot agree with a number of Dr. Barbor's statements, I wish to reinforce his point that traction is of great value in disc protrusions.

London, W.1. ALAN STODDARD.

TREATMENT OF ANEURYSMS

SIR,—In your leading article last week you were good enough to refer to work in the surgical unit at St.Mary's Hospital. Recent developments make it possible to add a few points to your review.

You stated that the aorta below the renal arteries and above the inferior mesenteric artery has been clamped for $1^3/_4$ hours in patients. The whole question of the length of the safe period for occlusion of major arteries is of importance to vascular surgeons, and our experience may be of assistance to others. The aorta below the renal arteries can be clamped for 3 hours at least; in patients requiring an aortic bifurcation graft we have often found it necessary to perform 5 anastomoses—the aorta and the 4 iliac arteries—and in difficult circumstances this may take a long time. On four occasions we have divided the inferior mesenteric artery close to its origin from the aorta; this appears to make no difference to the patient.

The major visceral branches present a different problem. In one patient we clamped both renal arteries and the aorta for 59 minutes; and in another, we clamped the aorta at the level of the diaphragm, the cœliac axis, the superior mesenteric artery, both renal arteries, and a number of the lumbar and lower intercostal arteries for 1 hour 57 minutes. Both patients recovered. This prolonged interruption of the blood-supply to these important organs was made possible by hypothermia. Dr. Cheatle and Dr. Churchill-Davidson lowered the body-temperature of the first patient to 82·4°F (28°C) and of the second to 79°F (26·5°C).

In our view the really important thing is the blood-flow to the spinal cord. In the second patient signs of spinal-cord damage were noted, but these have cleared completely. From this observation it appears that the maximum time for which it is safe to cut off the blood-flow to the lower portion of the human spinal cord is about 2 hours, even when the body-temperature has been lowered to 79°F.

The results in the second case open up a new field for surgical endeavour. You say that "at present those segments of the aorta which give rise to vital branches—such as the great vessels at the root of the neck, the cœliac axis, and the renal and superior mesenteric arteries—can only be treated by conservative surgery."

1. Harries, E. H. R., Mitman, M. Clinical Practice in Infectious Diseases. Edinburgh, 1951.

This patient had an aneurysm of the upper abdominal aorta; before operation pethidine was needed 4-hourly to subdue root pains; and his aneurysm was about to rupture through the skin of the back. Diseases of this segment of the aorta between the diaphragm and the renal arteries can now be treated by a direct surgical attack, if the clinical features justify it.

Mr. L. L. Bromley, who is visiting the U.S.A., was associated with us in this work.

Surgical Unit,
St. Mary's Hospital,
London, W.2.

CHARLES ROB
H. H. G. EASTCOTT.

SANARELLI-SHWARTZMAN REACTION

SIR,—Your annotation of March 6 recalls some remarkable experiments to which you did not refer. Shwartzman observed,[1] and others have confirmed, that his "phenomenon" could lead to the regression of transplanted and some spontaneous malignant tumours. A systemic reaction, it can nevertheless strike at the *loci minoris resistentiæ* with great accuracy.

When Shwartzman carried out his experiments, there were neither sulphonamides nor antibiotics. It would be highly instructive to have them repeated now that bacterial activity is so easily controlled. The therapeutic potential of such experiments must be, one would imagine, as great as those which resulted in 'Salvarsan' or 'Prontosil.'

London, S.W.10. F. E. WEALE.

POLIOMYELITIS AND INOCULATIONS

SIR,—Mr. Gray suggests in his letter of March 6 that the controls we used in our inquiry into the relation between inoculation and poliomyelitis were biased in such a way as to produce a spurious excess of recent inoculations in the children with poliomyelitis. We had, in fact, two types of controls paired for age and sex with the poliomyelitis cases—namely, (1) a child who had been notified at approximately the same date as suffering from measles; (2) a child, born at the same time as the poliomyelitis case, whose name was drawn from the register of the notifications of birth.

The former group Mr. Gray objects to on the grounds, firstly, that young children with measles may more often come from larger families and children in larger families are less likely to be immunised. This criticism has no substance since there is no difference between the poliomyelitis group and the measles group in the frequency with which they had been immunised at dates *more* than one month previously. Secondly, he suggests that measles may have already appeared in that family and thus have led to fewer inoculations in these control children in the preceding 28 days. This point might have more force but it is not borne out by our "birthday" controls.

Mr. Gray writes that these controls were also biased since "a 'birthday' control was only used if a measles control could not be found," and thus "the two sets of controls were not independent." In fact the choice between "measles" and "birthday" controls was made for each area and not for each child. If in any area there had been too few cases of measles to provide closely matched controls, then birthday controls were selected for all the poliomyelitis cases of that area. The two sets are, therefore, independent.

The data were analysed separately for the two sets of poliomyelitis and control children. They show that in the group of 88 poliomyelitis cases for which we had measles controls, 7 children had been inoculated within the preceding 28 days compared with 1 of the children with measles. In the group of 76 poliomyelitis cases for which we had birthday controls, 9 children had been inoculated within the preceding 28 days and none of the control children. Thus the larger excess of recent inoculations occurred in the opposite group to that predicted by Mr. Gray.

London School of Hygiene
and Tropical Medicine,
London, W.C.1.

A. BRADFORD HILL
J. KNOWELDEN.

PNEUMOCONIOSIS

SIR,—On March 1 the Minister of Pensions and National Insurance was asked in Parliament how many persons in receipt of compensation for industrial dust disease had died in the last four years and in how many of these cases could the diagnosis not be confirmed after death. The Minister's reply was that this information was not available.

I suggest, Sir, that, from the point of view of research into industrial dust disease, this is a very disappointing statement. I have myself repeatedly seen cases where the diagnosis of pneumoconiosis made during life could not be maintained at necropsy. This is, of course, no reflection at all upon the skill and ability of the pneumoconiosis panel of the Ministry of National Insurance. The fact remains that in our present state of knowledge the two diagnostic methods at our disposal—namely, clinical examination (including history-taking) and radiography—will not enable even the most expert examiners, such as the members of the pneumoconiosis panel, to make an intra-vitam diagnosis of pneumoconiosis with anything approaching practical certainty.

Since my own experience is necessarily limited to a rather small part of the coalfield, I have often wondered whether my experience of certified cases not confirmed post mortem is confined to my own area or whether it is common to all mining areas. The Minister's reply has set me wondering afresh. It is usual to base estimates of the incidence of pneumoconiosis on the number of certified workers. If it could be shown that the number of cases confirmed at necropsy is substantially lower than the number of cases certified during life, then it would appear that the true incidence of pneumoconiosis is lower than has hitherto been assumed. As the Minister is unable to help, there does not seem to be any way to get the full figures. But it may be possible to build up a picture from piecemeal figures, and the experiences of other practitioners working in coal-mining areas would be very valuable.

Abertillery, Monmouthshire. K. TRIGER.

TOXOPLASMOSIS

SIR,—We read with interest the paper by Dr. Skipper and his colleagues and your leading article (Feb. 6), in which you state that it cannot be assumed that the "dye test" of Sabin and Feldman is completely specific.

Evidence is fast accumulating that this serological method is not, in fact, completely specific. In 1951 Muhlpfordt found that antibodies reacting with toxoplasma in the dye test were also produced by animals infected with sarcocystis. He concluded that the test can be used in the diagnosis of sarcocystis infections, but that it cannot differentiate between this disease and toxoplasmosis. Again, in 1953, Michalzik applied the dye test in 50 cases of adult women infected with *Trichomonas vaginalis* and obtained a positive reaction in 64%, taking a titre of 1 : 25 as positive.

We have tested sera from a large number of sarcocystis-infected animals, and have confirmed that the dye test gives positive results on these sera. It does not, however, seem to be as reliable in the diagnosis of this infection as it is for toxoplasmosis.[1]

One of us[2] has investigated the use of *Sarcocystis tenella* spores in place of toxoplasma in the dye test and has found that *S. tenella* spores can be used effectively

1. Shwartzman, G. *Proc. Soc. exp. Biol., N.Y.* 1935, **32**, 1603; *Science*, 1935, **82**, 201.

1. Awad, F. I., Lainson, R. *J. clin. Path.* (in the press).
2. Awad, F. I. *Trans. R. Soc. trop. Med. Hyg.* (in the press).

for the diagnosis of both toxoplasma and sarcocystis infections.

It would seem, then, that whilst the Sabin-Feldman dye test may be of use in helping to establish the diagnosis of toxoplasmosis, its use is limited by incomplete specificity. On the other hand complement-fixation reactions are entirely specific for both infections.

We should like to emphasise the importance of not placing too great reliance on the dye test alone, especially in investigations on incidence in either man or animals. Complement-fixation reactions and animal inoculations must be included in such work.

London School of Hygiene and Tropical Medicine, London, W.C.1. F. I. AWAD
R. LAINSON.

APPARATUS FOR STERILISING LOOPS

SIR,—Dr. Frisby's account of his apparatus (March 6, p. 499) may direct further attention to what is really an unimportant aspect of laboratory precautions. The statement that "the flaming of wire loops causes infective particles to be released into the air is well known" is misleading, since the American authors quoted [1] say clearly that if "this process was repeated except that the inoculum was removed from a test tube instead of a flask a negligible number of organisms was recovered," showing that it was the splashing and spilling that constituted the chief danger. This conclusion agrees with that based on a survey of the contamination of benches during the handling of tuberculous material, which we carried out in this country.[2]

It should constantly be borne in mind that the danger is largely from splashing and in the transfer of infectious material from one container to another.

St. Mary's Hospital Medical School, London, W.2. W. HOWARD HUGHES.

OVERDOSE OF INTRATHECAL STREPTOMYCIN

SIR,—A boy of 14 was admitted to hospital on June 8, 1953, with tuberculous meningitis, the diagnosis of which had been completely proved by culture from the cerebrospinal fluid. He was treated with streptomycin and isoniazid continuously.

On Aug. 11 he was progressing favourably. A lumbar puncture was done and 32 drops of clear fluid drained. Pressure was high. Streptomycin 500 mg. was injected intrathecally, instead of the normal 50 mg.

At 6.30 P.M. he vomited and complained of pains in both legs. At 10 that evening he was reported to have vomited four times and was complaining of pain in the legs at that time. The pulse was 110 and of good volume. There was no headache or nausea. He was somewhat drowsy but able to answer questions. At midnight he was quieter and more drowsy, but still able to answer questions. The pains in the legs had gone. The reflexes were weak but present. His eyes were normal. There was no neck rigidity or retention of urine. He had vomited again. He vomited four times during the night. He was unable to move his legs and was very drowsy. Respirations were normal and the pulse of good volume. He was comatose and difficult to rouse. He understood when spoken to loudly, as far as could be ascertained. There was no headache or photophobia. The pupils were equal and reacted normally. Arm-jerks were present but diminished, and knee-jerks absent. Ankle clonus was present on both sides. The plantar responses were flexor. Kernig's sign was positive, and there was neck rigidity.

On Aug. 12 there was incomplete paralysis of the legs, with no foot-drop. There was some rigidity of the upper part of the legs and some ankle clonus. He was unable to pass urine.

The patient's condition remained unchanged during the day. Respirations were regular. The pulse was good, about 100, and the condition of the central nervous system unaltered.

On Aug. 13 he improved considerably. He was more easily roused and answered simple questions. There was no headache or photophobia. The reflexes were weak, and knee-jerks had not returned. Ankle clonus was now slight. Plantar responses were both flexor. He was able to move his legs a little. The pupils reacted to light and accommodation. At midnight he was sleeping well and appeared to be quite comfortable.

On Aug. 14 he had improved further. He was still drowsy but more easily roused and answered questions well. He complained of pain in the back at the site of the lumbar puncture. He was able to pass urine normally. The arm reflexes were present, but abdominals absent. There was slight ankle clonus and the plantar responses were flexor.

He continued to make good progress, and treatment with streptomycin, *p*-aminosalicylic acid, and isoniazid was continued. By January, 1954, he had been discharged and was having no further treatment.

The interest of this case is that a very large dose of streptomycin (500 mg.) was injected intrathecally in error, and at the time we did not know what results would follow so large a dose. I was unable to find any reference to any similar experience.

London, W.1. GERALD SLOT.

THE THIRD FONTANELLE

SIR,—Last week's letter from Dr. Carter and Dr. MacCarthy has provoked the following lines, which are dedicated with respect to Dr. Lightwood:

Isn't it a shocking show?
There is no paper to be read,
And no-one publicly has said—
So Hoyle and Franklin didn't know
What useful light Lightwood could shed
Upon the neonatal head.

Moral: If you'd have credit don't just chance it,
But put a paper in *The Lancet*.

London, W.1. ALFRED WHITE FRANKLIN.

SHOE DESIGN AND THE GREAT TOE

SIR,—May I assure Dr. Booth (Feb. 27) that I wished to convey that children's shoes should have a convex upper-sole surface. The need is even more urgent with children's than with adults' shoes since a proper convexity should not only keep the foot in position in walking but should protect it against certain specific risks. These are present when the body-weight presses on a foot resting on a flat-sole surface in a shoe with width to spare and when, for one reason or another, a shoe sole is capable of becoming scaphoid. The mechanism is self-evident. Mothers have a weakness for overwide shoes, and shoes of the sandal and plimsoll type too easily acquire scaphoid deformity. There is no need to underline the risks attaching to separation of the metatarsal heads in a young foot.

But why should Dr. Booth think that I contemplated arch "supports" or "pads"? If he will refer to the article [1] mentioned in my letter, he will be under no illusions as to my views about flexibility. But flexibility is not a matter of surface elevations. What is discussed is merely a logical extension of the principle whereby, in a two-dimensional sense, we already attempt to "fit" the foot.

London, W.1. MARGARET EMSLIE.

SIR,—The recent correspondence at least indicates the desire of doctors and others interested in foot health to correct a state of affairs which, for years, has been the outstanding cause of hallux valgus. On the other hand, the apparent nonchalance with which the majority of shoe designers persist in marketing unnatural shoe designs indicates their indifference to the seriousness of hallux valgus. In spite of the changing shoe styles, it is difficult to imagine any industry which has been so reluctant to accept its responsibilities to the public. It is, of course, true to say that half-hearted attempts have been made to educate the public, and the publication of pamphlets and the periodic presentation of foot-

1. Anderson, R. E., Stein, L., Moss, M. L., Gross, N. H. *J. Bact.* 1952, **61**, 473.
2. *J. clin. Path.* 1952, **5**, 371.

1. Emslie, M. *Lancet*, 1939, ii, 1260.

health exhibitions have no doubt been effective to a limited degree. Nevertheless, the foot-health exhibition which is taking place at the Royal Sanitary Institute at the present moment has little to interest the lay public, and the collection of models and footwear is hardly likely to cause a revolutionary change in shoe design.

May I earnestly appeal to the Ministries of Education and Health, and to school medical officers, municipal chiropodists, and everyone else who can help, to convene a meeting whereby a common policy can, at least, be formulated to determine the best methods of conducting a campaign on foot-health education?

Bush Hill Park, Middlesex. HENRY ROSENSTEIN.

HEXAMETHONIUM IN ULCERATIVE COLITIS

SIR,—The precise and authoritative article by Mr. Lockhart-Mummery and Mr. Counsell in your issue of Jan. 16 goes a long way to consolidate the work thus far done and leads us several steps ahead in the postoperative management of the patient with ulcerative colitis. May I add a further suggestion?

In this department we have undertaken trials, in preoperative and postoperative cases, of a hexamethonium bromide compound ('Vegolysen'), the results of which will be published presently. Our preliminary work has raised great hopes that the diarrhœa can be sufficiently controlled to make a patient's life bearable, and it seems likely that hexamethonium is going to make a useful contribution in the treatment of ulcerative colitis.

We have found that when the drug is given by mouth its hypotensive action is slight, and is not sufficient to interfere with treatment. Some patients have been given ephedrine to offset any serious fall of blood-pressure.

Queen Mary Hospital, Port Elizabeth, South Africa. P. JABKOVITZ.

Medicine and the Law

An Unusual Experiment

AFTER the jury had considered their verdict for 3½ hours, Raymond Barker, aged 35, was found guilty on March 4 at the Central Criminal Court of the murder of Mrs. James, aged 44, but insane at the time of committing the act.[1] The dead woman had been stabbed sixty times with a knife. Defending counsel had pleaded insanity. The accused, he submitted, was suffering from mania a potu. There was evidence that his grandfather was a heavy drinker, his grandmother was an alcoholic who spent 36 years in a mental institution, and a great-uncle was an imbecile. Dr. Rossiter Lewis, called by the defence, said that there was a gap in Barker's memory covering the time of the killing. The witness described how, with the medical officer at Brixton Prison, he had administered oxygen and 30% carbon dioxide with the object of creating an abreaction. The gas was at first given lightly, then more deeply to a point bordering on unconsciousness. At neither stage could he restore Barker's memory of the actual stabbing or of what happened immediately afterwards. The witness inferred that the accused's mind had been deranged at the time of the killing. Dr. J. C. M. Matheson, senior medical officer at Brixton, was called by the prosecution to give rebutting evidence. In his view Barker was not insane at the time; he formed the impression that, while the oxygen and carbon dioxide was being given, accused was deliberately holding back information.

This test with a so-called "truth drug" was, according to Dr. Matheson, carried out with the permission of the Home Office. The only condition imposed by the Prison Commissioners was that nothing should be done which might incapacitate Barker when he came up for trial. Mr. Justice Cassels, in summing up to the jury, told them they could dismiss the test from their minds because it yielded nothing. This must have been the first occasion that such an experiment has been tried where a plea of insanity was entered to a charge of murder. It can be assumed that the test was undergone voluntarily. Even if the value of such evidence could be established to their satisfaction, English judges would be unlikely to tolerate its admission if extracted under compulsion.

1. *Times*, March 3, 4, and 5, 1954.

Death after Drinking Anti-freeze Liquid

At an inquest[1] on March 5 the Birmingham city coroner recorded a verdict of accidental death on a 19-year-old Serviceman. The youth had come home on leave, and in the evening, with two friends, he drank three wineglasses of a mixture of ethylene glycol and orange squash before going to a dance. He was taken ill next day and died on the following day. One of his friends said that he was still under medical care after drinking some of the mixture; the other man said that he had been in hospital for two weeks and still had headaches. A pathologist stated that the cause of death was ethylene glycol poisoning, which had caused asphyxia and paralysis of the brain. As these disturbances seldom appeared immediately, people might go on drinking the liquid without realising the danger.

No Beds Available

Once again an inquest has furnished evidence of shortage of hospital beds and the difficulty of extemporising accommodation in emergency. A Wolverhampton patient died from internal hæmorrhage caused by perforation of a duodenal ulcer.[2] His doctor told the coroner how he had telephoned to four Midland hospitals without obtaining a bed. All that was needed, he said, was a place for the patient to lie down and have a blood-transfusion. Refusal of admission, according to Prof. J. M. Webster, deprived the patient of a chance of recovery. The jury, who found that the doctor had done everything possible for his patient, recommended that senior medical officers on duty at hospitals be empowered to admit emergency cases at once, even though the hospital beds are full, by using the casualty wards if necessary.

The doctor, it appeared, had not contacted the bed bureau; he explained that he thought there was a better chance of a doctor getting an emergency case into hospital than a bureau clerk. Evidence was given on behalf of the hospitals concerned. One hospital doctor said she had not appreciated that it was a doctor who was telephoning. Another said she knew of two couches in the casualty ward which had once been used in emergency, but she had no authority to send a patient there or to set up an emergency bed.

The secretary of the Wolverhampton Group Hospital Management Committee subsequently stated that the patient's doctor could either have sent in his patient as an emergency case or applied to the bed bureau or called in the domiciliary medical service which would promptly have provided a specialist at the bedside and blood-transfusion. The doctor had done none of these things. "If the patient had been sent in as an emergency case, we would have kept him," but the resident surgical and medical officers had no power to provide extra beds in hospitals. A statement from the Birmingham Regional Hospital Board indicated that the doctor should first approach the hospital direct and, if the application could not be met, approach the bed bureau. It added that, for an extremely urgent case, the senior medical officer in charge at the time had authority to put up an extra bed, if a ward was full, and it was his duty to do so.

1. *Times*, March 1, 1954.
2. *Birmingham Post*, Feb. 26, 1954.

Obituary

NORMAN GERALD HORNER

M.A., M.D. Camb., F.R.C.P., F.R.C.S.

In medical journalism—the smallest of the specialties, as he sometimes called it—Dr. Horner was counsellor and friend to all his juniors. As editor of the *British Medical Journal* for nineteen years, he gave the same kind of personal help to innumerable colleagues, and he also worked steadily to preserve sound standards in medicine. A traditionalist rather than an innovator, the motto he might have chosen for these dangerous years was that of the House of Orange—*je maintiendrai*. Fair-minded, sincere, but somewhat astringent, he saw the contemporary scene in a historical setting, and used his influence to prevent the best of the old being lost under the mass of the new. In all this he did more service than was obvious.

[*Elliot & Fry*

Born on Jan. 1, 1882, he was the son of A. C. Horner, M.R.C.S., of Tonbridge, and Frances Cooper. From Tonbridge School he went to Caius College, Cambridge, and thence to St. Bartholomew's Hospital, where he edited the hospital journal and qualified in 1906. After house-appointments at Barts and at Westminster Hospital, he quickly turned to journalism, joining the *Hospital* in 1908 as assistant editor. In 1911 he was appointed to the same position on the staff of *The Lancet*; but his career was interrupted by service with the Royal Army Medical Corps, chiefly in France, from 1915 to 1917; and on his return he became assistant editor of the *B.M.J.* After eleven years as deputy to Sir Dawson Williams, he succeeded to the editorial chair in 1928.

His predecessor, with thirty years of editorship behind him, had been a great power in the British Medical Association, and Horner did not rival him in that. He was abler with the pen than with the spoken word, whether on platform or in council; and his interest in medicine, and intense loyalty towards it, was little concerned with the politics of the moment. Similarly, in his choice of material for publication, he was irresponsive to anything resembling propaganda; but when he found that the man whose enthusiasm he mistrusted was in fact as sincere as himself, he would shed his air of irony and become a generous if critical coadjutor. Sir Arthur MacNalty recalls how, in discussions with the Ministry of Health on questions concerning general practice "I often admired the way in which Horner, while holding himself free to criticise if necessary, showed a masterly appreciation of the considerations which had led the Ministry to formulate the policy."

As an author Horner was elegant and clear; as a correspondent skilful and courteous; and as a conversationalist quietly witty. His talents in some ways exceeded his achievements, for the years that should have been most fruitful were darkened by personal misfortunes and illness. But he never lacked friends, either at Tavistock Square or elsewhere.

"It is some years since I last met Gerald Horner," writes Dr. Alfred Cox, "but I have lively and affectionate memories of him both as man and colleague. He was a good man to work with—if anything taking his work too seriously, I often thought. An editor must always carry a heavy load of responsibility and the job calls for much diplomacy. Horner had the necessary editorial gifts but he was badly handicapped in his later years by being dogged by ill health and especially by serious and painful eye trouble. Added to this he had more than his share of domestic troubles. All this was borne with a touching fortitude but eventually it became too much for him and he had to retire, greatly to the regret of the B.M.A. He remained the same courteous and kindly friend as of yore. But he regretted the ending of a career which he had loved and adorned."

When he retired he was at first able to undertake work of a rather less exacting kind.

"Horner's scholarly mind and wide knowledge of medicine," writes Sir Arthur MacNalty, "were joined to a rare ability for writing lucid English. It was therefore with the greatest pleasure that I welcomed him as a colleague in the preparation of the *Medical History of the Second World War*. Dr. Charles Newman had just left us to become dean of the Postgraduate Medical School, and I entrusted Horner chiefly with the task of preparing material and collating contributions for the two clinical volumes of the series—Medicine and Pathology, and Surgery, which Sir Zachary Cope has completed. In this task Horner's editorial experience and his knowledge of the way in which material had to be prepared for the press was of great assistance to us. Unfortunately, all too soon increasing ill health compelled him to resign and we severed our official connection with regret.

"Horner was somewhat shy and reserved, but was universally liked and admired for his sterling qualities and the courageous way in which he endured the ills and sorrows of life. He was interested in medical history, to which in his earlier years he had contributed papers of real value. When I was president of the History of Medicine Section of the Royal Society of Medicine I almost succeeded in getting him to read a paper to us, but his diffidence proved to be too great an obstacle. He did much for medical literature, medical ethics, and the diffusion of knowledge, and those who knew and worked with him mourn a true friend."

Happily, though Horner might have wished to go on working, the cessation of responsibility and the lightening of care brought great compensations. Making his home at the Savile Club, to which he had long been devoted, he showed again the gaiety and companionable spirit which were as much a part of him as his fastidious mind.

Dr. Horner died in London on March 7. His wife, who was Grace Malleson Fearon, died in 1950 and they leave a son.

LEWIS RALPH YEALLAND

M.D. West Med. Coll., Canada, D.Sc. West. Ont., F.R.C.P.

Dr. L. R. Yealland died on March 2, little more than a year after his retirement from the staffs of the Prince of Wales's General Hospital and the West End Hospital for Nervous Diseases.

He was educated in Canada and qualified from the University of Western Ontario in 1911, taking his M.D. the following year. During the 1914–18 war he came to this country, where, as a resident medical officer, and later as registrar, at the National Hospital, Queen Square, he was associated with Prof. E. D. Adrian in the treatment of war neuroses. In 1922 he took the M.R.C.P.

Soon after the war Yealland joined the staffs of the West End Hospital and of the Prince of Wales's General Hospital, and he lectured at the North-East London Post-graduate College. He also lectured on neurology at the Bethlem Royal Hospital. For some years he was Canadian representative on the executive council of the Universities Bureau of the British Empire, and the University of Western Ontario conferred on him the honorary degree of D.SC. He was elected F.R.C.P. in 1937.

Yealland's great interest was in epilepsy, and he did good work in elucidating hystero-epilepsy. B. W. recalls how Yealland would induce hysterical patients to produce fits at the clinic, and there only, with increasing periods of freedom from seizures at home.

"They were informed with absolute assurance that there could be no fits for a certain interval of time and he gravely wrote the next appointment at the clinic when the next fit, which would be milder, would be ready to take place. The final and last seizure was only partially induced, thereby demonstrating to the patient that a cure was effected. The patient, purely as a matter of interest, was advised to come and have a talk with him in three months' time. In most cases the treatment was a complete success. He had a large consulting practice, and even when the patient was beyond effective treatment, he always left behind him an atmosphere

of calm philosophy which was of great spiritual assistance to the household. In his later years he had few equals in the diagnosis of cerebral tumour.

"A non-smoker and teetotaller, L. R. Y. was a man of simple habits. His delightful personality will be missed by many both inside and outside the profession. His death is another instance of a lifetime of strenuous work in war and peace going unrewarded by any years of peaceful retirement."

HERBERT ALFRED BRITTAIN

O.B.E., M.A., M.Ch. Dubl., F.R.C.S.

Mr. Herbert Brittain, consultant orthopædic surgeon to the Norfolk and Norwich Hospital and United Norwich Hospitals, died at his home in Norwich on March 4, at the age of 50.

He was the son of the late J. W. Brittain, of Donnybrook, co. Dublin, and he was educated at Sedbergh School and Trinity College, Dublin, where he graduated in arts and medicine in 1926. He continued his studies at St. Bartholomew's Hospital, London, and he held resident appointments at Bristol, Portsmouth, Leicester, and the Royal National Orthopædic Hospital, London, before he took his F.R.C.S. in 1931. In the same year he also proceeded to the degree of M.CH.

[Douglas

He went to Norwich in the early 'thirties, at a time when the Norfolk and Norwich Hospital was changing and developing. He was elected assistant surgeon to the hospital in 1932, and in 1936 he was appointed surgeon in charge of the orthopædic department. He resigned his appointment of assistant surgeon to the hospital to throw all his energies into the new department, and under his guidance it grew rapidly. He had a large number of beds under his care; the department was linked with a group of outlying clinics in the country, and he came to be responsible for orthopædic cases all over Norfolk.

During the late war he served in the R.A.M.C. in Italy and the Middle East with the rank of lieut.-colonel, and he was appointed O.B.E. for his services. During these war years he was already studying the technique of arthrodesis, and in 1941 the first edition of his *Architectural Principles in Arthrodesis* appeared. The same year he was also appointed to a Hunterian lectureship at the Royal College of Surgeons.

Brittain had friends in many places and of all ages. H. P., writing for a slightly senior generation, describes Brittain's work on the principles and technique of joint arthrodesis as "original and arresting."

"He came to the practice of orthopædics after a comprehensive training in general surgery, and, endowed with exceptional manual dexterity, he quickly established himself as a bold and resourceful surgical craftsman. The Brittain ischio-femoral arthrodesis of the hip found its way into the repertoire of orthopædic surgeons throughout the world. Tommy Brittain's restless inquisitive mind and his physical vigour dominated every gathering of which he was a part. He worked unceasingly, with great devotion to his patients; and he played hard—on the squash-court in his earlier days, and in the hunting field to the last. His vital blithe spirit was infectious to all around him, and it sustained him during the bouts of ill health which sapped his vigour during the past two years. He had found great happiness in his second marriage, and there are many surgical pilgrims to this country who will gratefully recall the bountiful hospitality they enjoyed during visits to Norwich to see the latest refinements of arthrodesis technique."

C. N., a Norwich colleague, also acclaims Brittain as a first-class orthopædic surgeon.

"In all walks of life people fall into two groups—the solid and unerring or the brilliant and the dashing. Brittain was one of the dashing and the brilliant, and he was continually striving to improve his accomplishments. The last years of his life were clouded by a serious accident and a long illness, from both of which he seemed to have made good recoveries, and the last time I saw him, only a few days before his death, he seemed to be perfectly well and in high spirits, delighted at the recovery he had made."

R. C. H., who was Brittain's registrar and later his junior colleague, recalls their first meeting in 1940.

"He asked me, then a very junior house-officer, to play squash with him. Naturally I felt highly honoured, but at the same time imagined that I should win as youth was on my side. How wrong I was. He won easily because I could not keep up the pace. This was symbolic of Tommy Brittain and my first introduction to his remorselessness which won that game, as it did so much in his life and work.

"He had a terrifyingly attractive personality which occasionally baffled him because the wise and the foolish both came under his spell—and he didn't suffer fools gladly. Loved by countless patients, his flamboyant messianic character seemed to thrive on adulation, and yet strangely enough humility was one of his virtues. But it was the right sort of humility—private not public.

"He was a gifted conversationalist and writer with an incisive mind; and he loathed pedantry and plagiarism. Loving life with a youthful zest, he always made it exciting for others; dullness and boredom were alien to him.

"The orthopædic department in Norwich has lost a great man, but his memory will live in his grand ideas, the basic principles of orthopædic surgery that he taught so thoroughly, and the enthusiasm for the truth with which he inspired all who came under his influence."

ELINOR DOROTHY STOPFORD PRICE

M.D. Dubl.

Dr. Dorothy Stopford Price, consulting physician to St. Ultan's Hospital, Dublin, and to the National Hospital for Consumption for Ireland, died in Dublin on Jan. 30 at the age of 63.

Dorothy Stopford was educated at St. Paul's Girls' School, London, and at Trinity College, Dublin, where she graduated as M.B. in 1921. After holding a post as dispensary medical officer in co. Cork she settled in Dublin, where she became deeply interested in the study of tuberculosis in children. She joined the staffs of St. Ultan's Infant Hospital, the Royal National Hospital for Consumption for Ireland, and the Children's Sunshine Home at Stillorgan. The wide experience of her specialty which she gathered in the next years lent authority to her book, *Tuberculosis in Childhood*, which appeared in 1942, and through her efforts a unit for cases with primary tuberculosis was opened at St. Ultan's in 1945. As early as 1937 she had begun to use B.C.G. vaccine there, and the Irish government's campaign for its use, launched in 1949, was wisely centred at the hospital and she was appointed chairman of the national B.C.G. committee. Since 1950 illness had limited her work, but not her interest, and she continued her studies and her writings.

W. P. writes: "Dr. Dorothy Stopford Price was outstanding as a person and as a physician. She combined charm with vision, and zeal with an insistence that clinical work must be based on firm scientific foundations. Her vision led her to the introduction, at a great financial and personal sacrifice, of B.C.G. Her zeal made her organise and supervise extensive tuberculin surveys for Ireland. Her insistence on a scientific basis drove her on long and strenuous journeys to study the pathology of tuberculosis. She spent many hours in the post-mortem room selecting specimens for investigation. She had a rare gift for detecting the essential behind the phenomena, and many of these specimens proved to be cornerstones in our knowledge of epituberculosis, congenital tuberculosis, and the early histological changes in primary infection of the human lung—probably the earliest changes so far known. Her deep interest in her specialty—and her rare sense of humour—made her visits to London special occasions. But it was even more inspiring to meet her in Dublin—the centre of a circle of distinguished medical men, young and old, all enthusiastic for the promotion of medical knowledge.

She will long be remembered in the organisations which she created, in her publications, and, above all, in the memory of her grateful compatriots and her friends."

In 1925 she married Mr. Liam Price, D.J., who survives her.

CHARLES MONTAGU POWER
O.B.E., M.C.

Mr. C. M. Power, house-governor and secretary of the Westminster Hospital, died on March 6 at the age of 64.

He began his work at Westminster Hospital in time to manage its reconstruction in 1923, and he then learned much that proved of value when the new hospital, nurses' home, and medical school were built between 1934 and 1937. With great skill he elicited the needs of every department and every specialist—medical, nursing, teaching, and lay—and succeeded, without too many heart-burnings, in allotting space and facilities fairly between them. His knowledge of hospital affairs was freely called upon elsewhere. In the late war he was sector officer for an area stretching far into Surrey and adjacent counties. In 1944–45 he was president of the Incorporated Association of Hospital Officers. He was a member of the panel of advisers of the staff college set up by King Edward's Hospital Fund. Under the Joint War Organisation of the Order of St. John and the British Red Cross Society he was appointed inspector of hospitals and convalescent homes in the Home counties. In the 1914–18 war he had also had a distinguished record; for his services during these years he was mentioned in despatches and awarded the Military Cross.

E. R. C. writes: "In Charles Power the hospital world, and Westminster Hospital in particular, has lost an exceptionally gifted and knowledgeable administrator. A long training, begun at St. Bartholomew's and continued with devotedly hard work, together with his cheerful, inquiring, friendly temperament, made him in maturity an ideal house-governor. So long as he held the reins the need for a medically qualified chief officer was never felt. By his character he earned the high esteem of all with whom he came in contact, and the affectionate regard of all his close associates. It will be difficult indeed to fill his place."

DAME GRACE KIMMINS
D.B.E., D.St. J.

In 1903, with five pounds and an idea, Mrs. Kimmins, as she was then, began a great work. From an old, derelict, condemned workhouse and industrial school housing seven crippled London boys, she built the Heritage Craft Schools and Hospitals for boys and girls which now stand on Chailey North Common in Sussex. The social changes of the last 20 years make it difficult for us to realise how much imagination and resource were needed to meet the needs of the disabled at the turn of the century. There were no social insurance, free hospital services, special schools, or welfare agencies, and Dame Grace had to invent as well as provide them for her cripples.

The need for wider support soon became clear and in enlisting public sympathy Dame Grace was tireless, undaunted, and forthright. Not only did she raise a large sum to extend the work, but through her forceful personality and energy she gained the interest of people in all walks of life, who helped with money and service. Thanks to the interest and advice of Sir Robert Jones, for instance, facilities for medical treatment grew with the craft school, and ended in the establishment of hospital wards. The aim at the Heritage was to overcome any sense of inferiority in the crippled by enabling them—so far as was possible—to learn a trade, while also receiving general education. The craftwork included printing, bootwork, carpentry, silver-smithing, soft-toy making, and needlework. Games and remedial gymnastics were encouraged for the ambulant children: cricket and football for the boys, and netball and stoolball—an old Sussex game—for the girls. Through all these years of change and development she remained in charge and she gave up her direct interest only when the Ministry of Health took over in 1948. Even then she remained close at hand living in the Old Heritage, her home for many years, which incorporates the old workhouse in its fabric. In 1950 she was created D.B.E. She died on March 3.

"To one who came to know her only in retirement," writes E. P. Q., "she seemed small and frail but with a fertile active mind, still planning, still voicing her views with a forthright incisive manner. When her health allowed, she would attend the services at the boys' chapel in her wheeled chair, indomitable as ever, still anxious to see her growing family. Shrewd in her judgment of people, with the manner and way of the great impressario, she belonged to the generation of individualists. She could not accept defeat for herself or others, she believed in learning through the use of hand and eye, and her motto was 'give them the tools and let them finish the job.'"

C. G. L. describes her as "a spiritual successor of Florence Nightingale. She would fight like a tigress, scheme like a Machiavelli, persist like the importunate widow, wheedle, flatter, and enslave to attain her end, which for Miss Nightingale was the care of the sick and for Dame Grace was the physical, mental, and spiritual welfare of the crippled child. At Chailey Heritage, the public school of crippledom, the early casualties of life's struggle are trained to join in the fight again, and strengthened beyond their years. It is a prototype which has been copied all over the world, and thousands of men and women in Britain are leading happy and useful lives because of the craftsmanship they learnt there. Dame Grace was a dictator, she had to be, and she had some of the defects of a dictator. But she had the hallmark of true greatness, a divine sense of humour, and could, and did, laugh at herself. A goddess with a chuckle—truly, a great woman has gone from us."

Appointments

CLAYTON, S. G., M.D. Lond., F.R.C.S., F.R.C.O.G.: surgeon (consultant), Chelsea Hospital for Women, London.

DAWSON, R. L. G., M.B. Lond., F.R.C.S.: consultant plastic surgeon, Royal National Orthopædic Hospital, London.

EVANS, W. G., M.B. Camb., D.P.H.: M.O.H., borough of Scarborough, urban district of Scalby, and the rural district of Scarborough, and port M.O. borough of Scarborough, asst. county M.O. and school M.O.

FRASER, J. S., M.B. Edin., M.R.C.O.G.: obstetrician (S.H.M.O.), East Cumberland group of hospitals.

HOLLMAN, CATHERINE, M.B.: asst. M.O., Middlesex (Ealing and Acton).

KNAPPE, S. S., M.D. Warsaw: asst. M.O. (S.H.M.O.), Hensol Castle Mental Deficiency Institution, Pontyclun, Glam.

MCLEAN, R. D., M.R.C.S., D.T.M.&H.: asst. port health officer, Gravesend.

PHILLIPS, C. H., M.R.C.S.: temp. asst. M.O., Middlesex (Ealing and Acton).

SHAW, C. H., M.D. Lond., D.P.H.: senior administrative M.O., school health service, Nottinghamshire.

TOMKINSON, J. S., M.B. Birm., F.R.C.S., M.R.C.O.G.: obstetric surgeon (consultant), Queen Charlotte's Maternity Hospital, London.

WIGGLESWORTH, ROBERT, M.B. Lond., M.R.C.P., D.C.H.: consultant pædiatrician, Northampton and Kettering H.M.C.S.

Colonial Medical Service:

BLAND, R. H., M.D. Dubl., M.R.C.P.: D.M.S., Singapore.

BOWLER, D. P., M.B. Lond., M.R.C.P.: M.O., Federation of Malaya.

BROWNE, E. N. F., M.B. Belf.: M.O., Hong-Kong.

COLE, B. T. M. ABOKO-, M.B.: M.O., Sierra Leone.

CUSACK, C. A., L.R.C.P.I.: M.O., Northern Rhodesia.

GRANT, P. D., B.M. Oxfd: M.O., Tanganyika.

LADKIN, R. G., M.B.E., B.M. Oxfd, D.P.H.: S.M.O., Uganda.

LAYCOCK, H. T., M.B. Camb., F.R.C.S.: surgeon specialist, Nyasaland.

LETT, Z., M.D. Czechoslovakia: specialist anæsthetist, Hong-Kong.

MOOLLAN, I. A., M.B. Lond.: M.O., Mauritius.

ROGOFF, M. G., M.B.: M.O., Kenya.

TAYLOR, E., M.B.: M.O., Northern Rhodesia.

VERVOORN, J. D.: M.O., Gold Coast.

Leeds Regional Hospital Board:

BADHAM, J. N., M.R.C.S., D.P.M.: asst. psychiatrist and deputy medical superintendent (S.H.M.O.), Meanwood Park Hospital, Leeds.

DUKE, P. A., M.D. Glasg., D.P.M.: asst. chest physician (S.H.M.O.), Gateforth Hospital and Chest Clinics in the Goole, Pontefract, and Selby areas.

MARTIN, J. S., M.C., M.B. Belf., F.R.C.S.I., D.L.O.: part-time consultant in otolaryngology, Hull, East Riding, and Goole areas.

MORKOS, M. A. M., M.B. Cairo: senior casualty officer, Hull Royal Infirmary.

WESTON, J. W., M.R.C.S., D.T.M.&H.: asst. pathologist (S.H.M.O.), Halifax area.

WOJCIECHOWSKI, M. K., M.B. Polish School of Medicine, Edin.: asst. anæsthetist (S.H.M.O.), Dewsbury, Batley, and Mirfield Group.

Notes and News

RHEUMATOID ARTHRITIS AND THE PATIENT

PATIENTS with rheumatoid arthritis are apt to become very low-spirited, partly no doubt because of their painful, debilitating, and long-drawn-out disease, but also partly because of a shrewd notion that doctors know very little about it, and are not much good at achieving a cure. It would encourage them to be told at the outset that at least we know something about the natural history of this disease, and that we can do a good deal to ease them, and to help the trouble to burn itself out.

To this end the Empire Rheumatism Council have published a good little handbook [1] for general practitioners to hand to their rheumatoid arthritis patients. It not only explains honestly and simply what we know, so far, about the disease and its treatment, but also gives the patient clear advice about the ways in which he can help himself. Important messages appear in black type—such things as "Never put a pillow under your knees at any time (however much helpful attendants may suggest it)"; and "Do not imagine that by wearing a splint you are increasing the chance of a joint becoming permanently stiffened. You are doing just the reverse." Most patients believe that the only way to prevent an inflamed joint from stiffening is to "keep it going": the fact that it may become stiff because it has become permanently inflamed by overuse comes freshly to them, and needs explaining.

The points made in the text are summarised every few pages, five or six of them appearing together in small frames under headings which include "rheumatoid arthritis," "general health," "prevention of deformity," "muscles and joints," and "drug treatment." The emphasis throughout is on what the patient can do for himself by coöperating with the doctor; but a short section on drugs, at the end, will answer some questions which he will naturally want to put. Acetylsalicylic acid is given its due as the sheet-anchor, the value of gold therapy is explained, and cortisone and corticotrophin are described as agents which can temporarily reverse the arthritic process without providing a cure. Some little illustrations by Leslie Starke, good and amusing in themselves, will attract many readers but may seem to others not quite in keeping with the mood and purpose of the sober and useful little handbook.

GUY'S HOSPITAL DENTAL SCHOOL

THE annual clinical meeting of Guy's Hospital Dental School was held on March 6. Sir William Kelsey Fry, making a welcome return visit, discussed some of the problems of the impacted wisdom tooth. He said that he was first introduced to the subject some forty years ago, when local anæsthetics were uncertain and operations on impacted teeth were largely the concern of the general surgeon. As the result of a visit to this country by the late Dr. George Winter, Sir William decided to go to the United States to study Dr. Winter's technique. The success of these operations was based on a careful assessment of all the anatomical factors concerned, and, in Sir William's view, there is no other surgical operation which requires such detailed consideration of individual variations in anatomy. With the help of slides prepared by the Postgraduate Medical School, he explained how to decide which teeth could be removed with comparative ease and which were better left alone unless there was some really pressing indication for their extraction.

The steady progress in new materials and methods was exemplified in the exhibits of many of the departments of the dental school. Autopolymerising resins for dental fillings are no longer novelties and now that their uses and limitations are better understood, they are taking their place with the older materials. Increasing use is being made of chrome-cobalt alloys for denture construction. These alloys have the advantages of great strength and resistance to corrosion, but they are intractable substances to cast and polish; the prosthetics laboratory at Guy's is now being equipped with sand-blasting apparatus and the necessary high-speed lathes for finishing this material. As is customary on this occasion, the meeting was full of interesting things and valuable lessons.

1. Rheumatoid Arthritis. To be had, free of charge, from the Empire Rheumatism Council, Tavistock House North, Tavistock Square, London, W.C.1. 1953. Pp. 31.

SMOKELESS FUELS

WE are all well informed, by now, about the dangers to life and fabric of smoke, fog, and smog, and we feel duly guilty over the contribution our domestic hearths make to these pestilent vapours. But the obscurity which envelops this subject prevents us from discerning clearly what we ought to do about it.

An exhibition designed to give the public a lead was lately held in Charing Cross underground station by the British Smokeless Fuels Federation, which represents the Gas Council, the British Cooking Industry Association, the South-Western Division of the National Coal Board, and the Low Temperature Coal Distillers' Association of Great Britain Ltd. Naturally enough, the federation's solution to the problem is the wider use of smokeless fuels; and they showed samples of these fuels now available—namely, Welsh anthracite and dry steam coals, which are natural products, and gas coke, hard coke, low-temperature cokes ('Coalite' and 'Rexco'), and carbonised ovoids ('Phurnacite'), which are manufactured fuels. These were shown burning in modern open grates, and in openable stoves. The saving in fuel was set out in plain figures: an old-fashioned open fire burns 2 cwt. of house coal a week; a modern grate $1\frac{1}{4}$ cwt. of smokeless fuel a week; and an openable stove only $\frac{7}{8}$ cwt. of smokeless fuel. This reduced consumption, moreover, is associated with a gain in heat, and a great reduction in draughts.

The trouble about smokeless fuels, of course, is that there are not enough of them; but the federation think that by 1957 it should be possible to make 10 million tons a year available, and by 1962 15 million tons a year. The need for their use is greatest in our "black spots"—Greater London, the Black Country, South Lancashire, the West Riding, and the Clyde, Tyne, and Tees. The federation encourage us further with the thought that in thus reducing our fog production we shall much increase our output of chemicals, fertilisers, drugs, antiseptics, plastic, dyes, nylon, and all the other useful or pretty things which are at present going up in smoke.

THE BROTHER TONGUE

IT is unusual to hear anyone speak well of the language of science, especially anyone who is a confessed lover of words. Mr. Savory,[1] however, is both a philologist and a teacher of biology, and a loyal interpreter of each camp to the other. Parts of his book cover ground familiar to scientists, parts ground familiar to philologists: for only by including the elements of both kinds of learning does he see any hope of effecting a synthesis of their points of view.

His defence of the language of science is extraordinarily good: he wisely does not attempt to defend the euphony, grace, or style of scientific writing, but he does insist on its universal intelligibility. Cold, dry, precise, and often ugly, it is nevertheless rich in terms which scientists of every nation have accepted and can comprehend. Each branch of science has its own vocabulary, and often groups of words follow a distinctive pattern. Thus the metals, by convention, often have names ending in "-um" (titanium, uranium, potassium, chromium), the physical subsciences (perhaps guided by "mathematics") have "ics" as a termination (dynamics, kinetics, electrostatics); and the names of many sciences terminate in "ology." Many of the terms are unexpectedly old: thus "anthropology" dates from 1593, "mechanics" from 1648, "titanium" from 1796. Measuring instruments often terminate in "ometer"—beginning with "barometer" in 1665. Physical units of measurement often perpetuate a man's name, from the "ampere" of 1881 to the "henry" of 1893. This practice of naming newcomers to a series according to recognised system has, of course, done much to establish and maintain communications between scientists speaking different languages. Moreover, scientific words from the moment of their first use are new words: they are not surrounded by a halo of associations and secondary meanings—they mean only one thing, and they keep within their boundaries in a way that words in common use seldom do. Hence scientific prose, almost alone among the different categories of prose, can be translated into other languages not merely satisfactorily but perfectly; and can often be read in the original with a reasonable degree of understanding by a scientist with the merest smattering of the language in which it is written. While there are plenty

1. The Language of Science. By THEODORE H. SAVORY. London: Andre Deutsch. 1954. Pp. 184. 10s. 6d.

of obstacles to scientific research, the problem of language, Mr. Savory believes, is not as a rule the most formidable.

But if scientific writing has this outstanding merit it has also some acknowledged defects, some indeed being the defects of its merits: thus it is often polysyllabic, seldom elegant, inevitably lacking in emotional tone, inattentive to beauty, and (according to Mr. Savory) almost wholly without humour. In the office of this journal we would subscribe to all these strictures (and add a few more of our own) except the last. In handling their ponderous material, medical writers are—so it seems to us—acquiring a lighter touch, and some are already willing to risk an occasional joke. Moreover, even serious truths can be stated neatly. Here is Sir Russell Brain, noting how quick even quite simple brains can be at learning essential patterns: "If a mouse is to succeed in recognising and reacting appropriately towards a cat, it must do so the first time or not at all."

TRANSFUSION RISKS

BLOOD-TRANSFUSION is not the straightforward procedure everybody hoped it would be when that pioneer dog was transfused at the Royal Society in 1666, as Evelyn and Pepys record. As so often happens with our good inventions, initial success has been followed by a growing understanding of the risks. A booklet,[1] drawn up by the National Blood Transfusion Service, has just been revised and reprinted and reissued; and only the most experienced transfusionists can afford to be without it. It gives advice about the choice of fluid, the storage of blood and plasma, the volume and rate of transfusion, blood-grouping and compatibility testing, the administration of transfusions, proper record-keeping, complications and dangers, the investigation of transfusion reactions, and the Rh factor. The pages are thickly sown with warnings—as, for instance, that the transfusion of plasma substitute may interfere with compatibility tests made afterwards; that blood-grouping and compatibility testing is work for those who have had special instruction and experience in the technique; that blood that has been frozen and thawed, and blood that has been hæmolysed by overheating, may both cause death; that some Rh-negative mothers may become immunised by the Rh factor when carrying Rh-positive fœtuses, and if they are later transfused with Rh-positive blood they may suffer a fatal hæmolytic reaction: moreover, a single transfusion may so sensitise a girl or woman to the Rh antigen that any Rh-positive child she subsequently carries may be affected with hæmolytic disease in its severest form. But if warnings are many and sobering the directions for avoiding them are full, explicit, and comprehensibly set out. This is a booklet which should save many lives.

REACTIONS TO INJURY

THE medical profession is indebted to the British Council for a number of valuable symposia which have appeared in the *British Medical Bulletin*. These cover a wide range of subjects in which recent developments have been striking—e.g., physics, measurement, isotopes, and viruses in medicine; currents in biochemistry, chemical carcinogenesis, and enzyme research; mental health; malaria, neurology, and anæsthesia. Different aspects of each subject are discussed in short and readable summaries by writers who have made substantial contributions to the work reported.

The latest number,[2] on Reactions to Injury, is well up to the expected standard. War-time experience of wound shock and its treatment is summarised by R. T. Grant and by R. Bodley Scott, the subject of burns by J. P. Bull, that of body-fluid distribution by F. C. Courtice, and that of transfusion materials by Sir Alan Drury and his colleagues at the Lister Institute. New developments in blood storage are foreshadowed by the work of P. L. Mollison. The clinician with some knowledge of the subject of injury will value these concise and informative reports, but he may well enjoy more the accounts of work in (to him) less familiar fields. For example, the sections on metabolic changes after injury (D. P. Cuthbertson), on war gases (H. Cullumbine), on gas-gangrene (C. L. Oakley), and on tetanus (G. Payling Wright) are excellent. Professor Payling Wright makes the sensible plea that young children should be immunised against tetanus as well as diphtheria, in combined inoculations. W. Ritchie Russell writes of head injury from an experience of over twenty years' study of this condition; J. B. Cavanagh and R. H. S. Thompson discuss demyelination. H. N. Green and H. B. Stoner give an interesting review of their work on injury and carbohydrate metabolism; and there is a short article by J. D. Judah and W. G. Spector on the reactions of enzymes to injury. True, there is little to record yet of enzymes in trauma; but "the investigation of enzymic reactions to injury has scarcely begun."

As Sir Edward Mellanby writes in his introduction: "For those interested in the advances of this branch of medical science, and especially for those about to enter this field of study, there could be no better starting-off ground than the present volume . . ."

1. Notes on Transfusion. Issued by the Ministry of Health for the Blood Transfusion Service, January, 1954. Pp. 18.
2. *Brit. med. Bull.* 1954, 10, no. 1.

A TWO-YEAR-OLD GOES TO HOSPITAL

AN illustrated guide has now been prepared to the film of this title,[1] which shows the behaviour of a little girl during eight days in hospital when she was separated from her parents apart from visiting-hours. A 20-page booklet, it contains 8 stills from the film besides the cover illustration, and it gives details about the reasons for making the film, and about the methods employed, together with further information about the child who was filmed, and points for use by the presenter in discussion after the showing.

The film is available in English and French versions for showing to professional groups under suitable conditions of presentation and discussion. It is hoped that medical schools may use it in teaching students and nurses. Full details may be had from the producer and photographer, Mr. James Robertson, Tavistock Institute for Human Relations, 2, Beaumont Street, London, W.1.

LA PRESSE MÉDICALE

A LUXURIANT commemoration number[2] marks the 60th anniversary of the *Presse Médicale*. The mainspring in founding the journal was Dr. E. de Lavarenne, who, owing to poor health, was obliged to forgo life in Paris and became a physician at the spa of Luchon. The season there lasted only four months and Lavarenne, cultured and extremely competent, was at a loss until the project of founding a journal came to him. He thereupon saw his friend Maurice Letulle, who was so enthusiastic that he was able to persuade Landouzy, Roger, Lermoyez, and others to form the editorial staff, with Lavarenne as general secretary. The first weekly number, which appeared on Dec. 23, 1893, contained articles on zona and tuberculosis, heat regulation in fever, hepatobronchial fistula, and a field-dressing for the soldier, and reports of medical meetings including those of four British societies. In 1894 the journal set up a laboratory for the diagnosis of diphtheria, which functioned for a year and pointed the way for the government laboratories that followed. The journal published the work of Widal and Béclere on the serodiagnosis of typhoid, and an article by Olivier entitled Photography of the Invisible dealing with the physics of Röntgen's discovery. Despite war difficulties and the disaster in 1929 when four editors died in a month, the journal made headway and in 1933 the volume ran to 3200 pages and had a circulation of 25,000 copies.

1. See *Lancet*, 1952, ii, 1122.
2. *Pr. méd.* Dec. 25, 1953.

University of Oxford

On Feb. 27 the degree of D.M. was conferred on C. C. Kennedy.

University of Durham

On July 3 the honorary degree of D.C.L. will be conferred on Sir Russell Brain, P.R.C.P.

University of Nottingham

Boots Pure Drug Company Limited has given £100,000 to the university to endow a chair of pharmaceutical chemistry in honour of Lord Trent and a chair of chemical engineering in honour of Lady Trent.

Royal Faculty of Physicians and Surgeons of Glasgow

At a meeting of the faculty on March 1, with Dr. Andrew Allison, the president, in the chair, Neelakantan Radhakrishnan was admitted a fellow (qua physician).

Abernethian Society

At the next meeting of this society at 4.30 P.M. on Friday, March 19, at St. Bartholomew's Hospital, London, E.C.1, Prof. Melville Arnott will speak on the Ætiology of Cardiovascular Disease.

Royal Society of Arts

On Wednesday, March 17, at 2.30 P.M., at the society's house in John Adam Street, London, W.C.2, Prof. E. D. Adrian, O.M., P.R.S., will deliver the Trueman Wood lecture on Recent Developments in the Study of the Sense Organs.

Society of Chemical Industry

The food group of this society is to hold a joint meeting with the Royal Sanitary Institute on Friday, April 30, at the Spa, Scarborough, at 10 A.M., when the general subject for discussion will be Food Hygiene and Food Preparation in the Home and Kitchen.

World Health Day

The constitution of the World Health Organisation came into force officially on April 7, 1948. The anniversary is now kept each year as World Health Day. In celebration of the Florence Nightingale centenary the theme chosen for 1954 is the Nurse—Pioneer of Health.

Wessex Rahere Club

A dinner of this club will be held at the Royal Clarence Hotel, Exeter, on Saturday, April 24, when Mr. H. Jackson Burrows will be the guest of honour. Membership of the club is open to all Barts men practising in the West Country. Further details may be had from Mr. A. Daunt Bateman, the hon. secretary, 11, The Circus, Bath.

New Psychiatric Service at Sheffield

The board of Sheffield United Hospitals has drawn up with Sheffield University a scheme for the treatment of psychiatric patients. It is proposed to set aside up to 12 beds at Sheffield Royal Infirmary as a diagnostic unit, to be linked with an enlarged recovery unit at the Woofindin Rehabilitation Centre at Fulwood. The university department of psychiatry will extend their facilities for outpatient consultation.

Presentation to Dr. David Nabarro

On March 1 a presentation party was held at The Hospital for Sick Children, Great Ormond Street, to mark Dr. Nabarro's 80th birthday. In making the presentation Dr. Bernard Schlesinger recalled that Dr. Nabarro was appointed bacteriologist to the Hospital in 1912 and was later elected director of the pathological department. He was primarily responsible for the creation of the biochemical laboratory. He initiated the first venereal-disease clinic in the hospital in 1917, and his record of more than two decades' observations on congenital syphilis is about to be published. The presentation consisted of the old and the new, being a pair of 18th-century Sheffield plate tea caddies, an 18th-century Nanking teapot, an 18th-century Crown Derby cup and saucer, and a tea alarum.

The *Proceedings of the First International Congress of the World Confederation for Physical Therapy*, held in London last September, have now been published. Copies (12*s.* 6*d.*) may be had from the Chartered Society of Physiotherapy, Tavistock House (South), Tavistock Square, W.C.1.

On behalf of the British Council this month Prof. John McMichael is visiting the universities of Vienna, Graz, and Innsbruck, and Prof. J. H. Burn, F.R.S., the universities of Louvain and Liége.

Dr. T. M. Ling, who led the British Medical Association's mission to Latin America in 1952, has been made a member of the Order of Carlos J. Finlay by the President of Cuba.

Surgeon Captain W. G. Thwaytes, M.D., R.N. retd, has been appointed sheriff of Westmorland.

The United Hospitals Festival Choir, on March 23 at 7.30 P.M., in the Royal Albert Hall, is giving a performance of the Messiah to commemorate the 211th anniversary of the first performance.

Births, Marriages, and Deaths

BIRTHS

STEWART.—On March 3, at Ipswich, to Peggy, wife of C. J. Stewart, M.D.,—a daughter.

Diary of the Week

MARCH 14 TO 20

Sunday, 14th

EAST ANGLIAN REGIONAL ASSOCIATION OF ANÆSTHETISTS
2.30 P.M. (East Suffolk and Ipswich Hospital, Anglesea Road, Ipswich.) Dr. John Gillies: New Concepts in Anæsthetic Practice.

Monday, 15th

HUNTERIAN SOCIETY
7.30 P.M. (Talbot Restaurant, London Wall, E.C.2.) Prof. L. P. Garrod, Dr. G. Mitchell-Heggs: Misuse of Antibiotics.

Tuesday, 16th

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1
5 P.M. Prof. M. L. Rosenheim: Treatment of Severe Hypertension. (First of two Oliver-Sharpey lectures.)
ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
8 P.M. *Section of Pathology.* Prof. Dorothy Russell, Mr. Murray Falconer, Miss Diana Beck, Dr. W. H. McMenemey: Pathology of Spontaneous Intracranial Hæmorrhage.
INSTITUTE OF DERMATOLOGY, St. John's Hospital, Lisle Street, W.C.2
5.30 P.M. Dr. P. Wade: Treatment of Epithelioma of the Skin.
HARVEIAN SOCIETY OF LONDON
8 P.M. (Royal College of Surgeons, Lincoln's Inn Fields, W.C.2.) Dr. A. H. Douthwaite: Duodenal Ulceration. (Harveian lecture.)
SOUTH WEST LONDON MEDICAL SOCIETY
8.30 P.M. (Bolingbroke Hospital, Wandsworth Common, S.W.11.) Dr. P. A. B. Raffle: Uses of Medical Statistics.
MANCHESTER MEDICAL SOCIETY
4.30 P.M. (Medical School, University of Manchester.) Prof. Wilfrid Gaisford: Victuals and Vitamins.

Wednesday, 17th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5 P.M. Dr. T. Cecil Gray: Disintegration of the Nervous System. (Joseph Clover lecture.)
ROYAL SOCIETY OF MEDICINE
8.15 P.M. *Section of General Practice.* Dr. John Sanctuary, Mr. D. Maxwell, Dr. H. A. Davidson: The Infertile Marriage in General Practice.
INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. H. Haber: Precancerous Conditions of the Skin.
ROYAL SOCIETY OF ARTS, John Adam Street, W.C.2
2.30 P.M. Prof. E. D. Adrian, O.M., P.R.S.: Recent Developments in the Study of the Sense Organs.
MIDLAND MEDICAL SOCIETY
8.15 P.M. (Birmingham Medical Institute, 154, Great Charles Street, Birmingham, 3.) Dr. H. F. Humphreys: Magic and Medicine.

Thursday, 18th

ROYAL COLLEGE OF PHYSICIANS
5 P.M. Professor Rosenheim: Treatment of Severe Hypertension. (Second of two Oliver-Sharpey lectures.)
UNIVERSITY OF LONDON
5.30 P.M. (London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1.) Prof. A. C. Lendrum: Pulmonary Changes Due to Cardiac Disease.
CHARING CROSS HOSPITAL MEDICAL SCHOOL, 62, Chandos Place, W.C.2
5.30 P.M. Sir Lionel Whitby: Dynamics of Hæmopoiesis. (Huxley lecture.)
UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL, University Street, W.C.1
5 P.M. Prof. G. L. Brown, F.R.S.: Sympathetic Nervous System. (Sydney Ringer lecture.)
BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck Street, W.1
8 P.M. Mr. D. Innes Williams: Urinary Obstruction in Early Years.
INSTITUTE OF PSYCHIATRY, Maudsley Hospital, Denmark Hill, S.E.5
5 P.M. Dr. G. M. Carstairs: Attitudes to Death and Suicide in an Indian Cultural Setting.
LONDON JEWISH HOSPITAL MEDICAL SOCIETY
8.30 P.M. (11, Chandos Street, W.1.) Dr. F. Avery Jones: Clinical Problems of Gastro-enterology.

Friday, 19th

POSTGRADUATE MEDICAL SCHOOL OF LONDON, Ducane Road, W.12
2 P.M. Prof. R. A. Willis: Metaplasia.
ROYAL SOCIETY OF MEDICINE
4.30 P.M. *Section of Epidemiology and Preventive Medicine.* Dr. W. P. D. Logan: Social Class Variation in Mortality in 1950 Based on 1951 Census 1% Sample Tables.
8.15 P.M. *Section of Radiology.* Dr. John Fawcitt: Radiological Pattern of Pseudocoxalgia. Mr. J. I. P. James: Scoliosis in Childhood.
FACULTY OF RADIOLOGISTS, Royal College of Surgeons, Lincoln's Inn Fields, W.C.2
2.15 P.M. *Radiodiagnosis section.* Dr. Roy Astley, Dr. J. W. Gerrard: X-ray Diagnosis of Cœliac Disease. Dr. R. E. Steiner, Mr. Ian Donald: Respiratory Diseases in the Newborn.

Saturday, 20th

BIOCHEMICAL SOCIETY
10.45 A.M. (University College, Gower Street, W.C.1.) Scientific papers.

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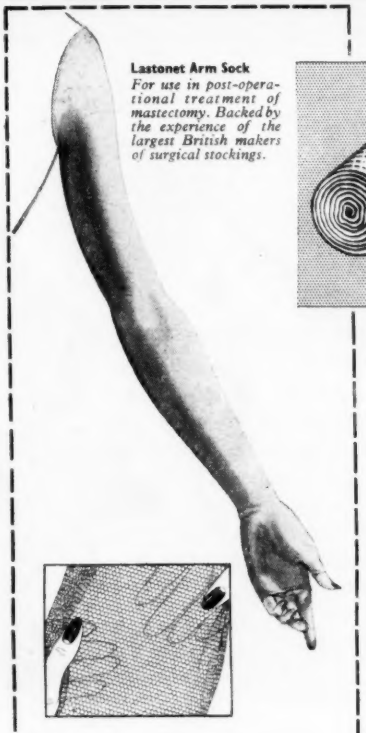

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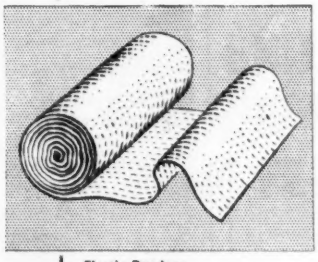

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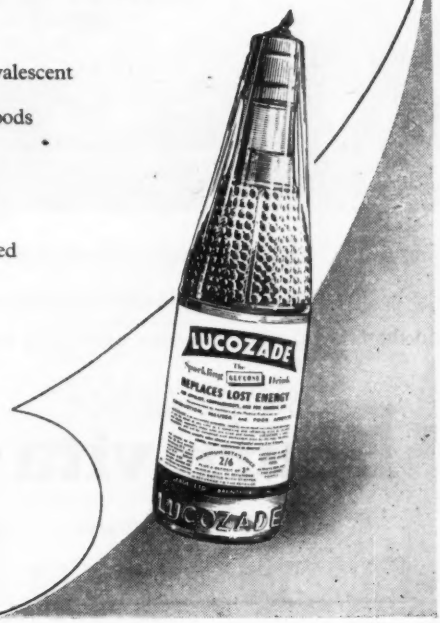

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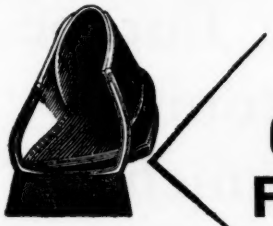

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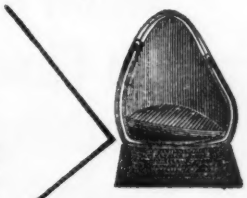

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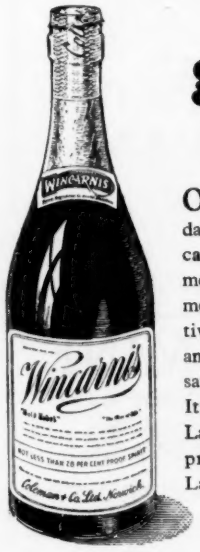

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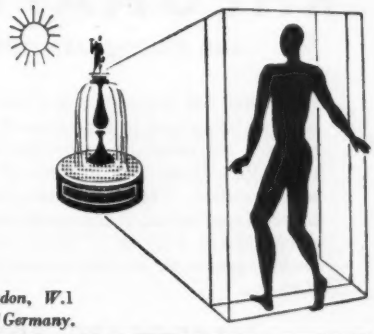

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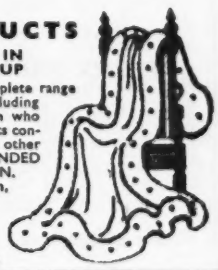

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Vacancies

ACADEMIC AND EDUCATIONAL SECTION — Page 39

ANÆSTHETICS

Highlands Gen., N.21. H.O. 41
North West Met. R.H.B. P.-t. Cons. 40
Woolwich Group H.M.C. Sr. H.O.'s 43
Barnsley. Beckett. Reg. 43
Birmingham United Hosps. Sr. H.O. & Reg. 43/44
Bradford. Royal Infy. H.O. 45
Bradford. St. Luke's. H.O. 44
Bromley Group H.M.C. Sr. H.O. 44
Bury & Rossendale H.M.C. Sr. H.O. 44
Coventry Group 20 H.M.C. Sr. H.O. 45
Douglas. Noble's I.O.M. H.O. 45
Dudley, Stourbridge & Dist. Sr. H.O. 46
East Anglian R.H.B. Sr. H.M.O. 40
Enfield. Chase Farm. Sr. H.O. 46
Glasgow Royal Infy. Sr. H.O. 46
Guildford. Royal Surrey County. Sr. H.O. 46
Harold Wood, Essex. Sr. H.O. 47
Leamington Spa. Warneford Gen. H.O. 48
Leeds R.H.B. Reg. 47
Leeds. United Leeds. Reg. 47
Leeds United Hosps. Sr. H.O. 47
Liverpool United Hosps. Reg. 48
Maidstone. Mid-Kent H.M.C. Sr. H.O. 48
Manchester R.H.B. Regs. 48
Manchester United Hosps. Reg. 48
Manchester. West Manchester H.M.C. Sr. H.O. 48
Norwich. Norfolk & Norwich. Sr. H.O. 49
Nottingham Hosp. for Women & Child's. Reg. 50
Portsmouth Group H.M.C. Sr. Reg. 50
Rochdale & Dist. H.M.C. Sr. H.O. 51
Scotland. Northern R.H.B. Sr. H.M.O. 41
Sheffield R.H.B. Locum Regs. & Sr. Reg. 51
Sheffield R.H.B. P.-t. Cons. 40
Sheffield United Hosps. Sr. H.O. 51
Shrewsbury. Royal Salop Infy. & Copthorne. Sr. H.O. 51
Wakefield A Group H.M.C. Jr. H.M.O. 52

CASUALTY

Battersea Gen., S.W.11. H.O. or Sr. H.O. 41
Central Middlesex, N.W.10. Sr. H.O. 41
Dreadnought Seamen's, S.E.10. Sr. H.O. 41
Hackney, E.9. H.O. 41
Lambeth, S.E.11. Sr. H.O. or H.O. 41
Royal Northern, N.7. H.O.'s 42
Birmingham United Hosps. Sr. H.O. 44
Birmingham United Hosps. Reg. 43
Bolton Royal Infy. Sr. H.O. 44
Canterbury. Kent & Canterbury. Sr H.O. 45
Colchester Group H.M.C. Sr. H.O.'s 45
Coventry Group 20 H.M.C. Sr. H.O. or H.O. 45
Derby. Derbyshire Royal Infy. Sr. H.O. 45
Dudley, Stourbridge & Dist. Sr. H.O.'s 46
Edgware Gen. Jr. H.M.O. 46
Hounslow, Middx. Sr. H.O. 46
King's Lynn. West Norfolk & King's Lynn Gen. Sr. H.O. 47
Leamington Spa. Warneford Gen. Sr. H.O. 48
Leeds. Public Dispensary & Hosp. Sr. H.O. 47
Liverpool. Bootle. Jr. H.M.O. 48
Liverpool R.H.B. Sr. Cas. Officers 40
Liverpool United Hosps. H.O. 47
Maidenhead. H.O. 48
Maidstone. West Kent Gen. Sr. H.O. 48
Northampton Gen. Sr. H.O. & H.O. 49
North East Met. R.H.B. Reg. 42
Pontefract Gen. Infy. Sr. H.O. 50
Romford. Oldchurch. Sr. H.O. 50
Sheffield. City Gen. Reg. 51
Southend Gen. H.O. 51
Worcester Royal Infy. Sr. H.O. 53
York A & Tadcaster H.M.C. Jr. H.M.O. 53

CHEST AND TUBERCULOSIS

London Chest, E.2. Sr. H.O. or Reg. 42
North West Met. R.H.B. Sr. H.M.O. 40
St. Charles', W.10. Locum Sr. H.O.'s & H.O. 42
Benenden San. Sr. H.O. 43
Birmingham R.H.B. Reg. 43
Colchester Group H.M.C. Sr. H.O. 45
Dagenham, Essex. Jr. H.M.O. 45
Derby. Derwent. Reg. 45
Dudley, Stourbridge & Dist. Sr. H.O. 46
Grimsby. Springfield. Reg. 46
Isleworth. West Middlesex. H.O. 47
Leeds R.H.B. Sr. H.M.O. 40
Market Drayton. Cheshire Joint San. Jr. H.M.O. or Sr. H.O. 48
Newcastle R.H.B. Reg. 49
North East Met. R.H.B. Reg. 42
Salisbury Group H.M.C. Jr. H.M.O. 51
Talgarth, Brecon. South Wales San. Jr. H.M.O. 52
Ventnor, I.W. Royal Nat. Hosp. for Diseases of the Chest. Jr. H.M.O. & Sr. H.O. 52
Wakefield. Pinderfields Gen. Sr. H.O. or Locum Sr. H.O. 52
Northern Ireland Hosps. Auth. P.-t. Cons. 41

DERMATOLOGY

East Anglian R.H.B. P.-t. Cons. 40

EAR, NOSE, AND THROAT

St. Bartholomew's, E.C.1. Sr. Reg. 42
Ashford, Middx. H.O. 43
Aylesbury. Royal Bucks & Assoc. Hosps. M.C. H.O. & Locum H.O. 43
Brighton & Lewes H.M.C. Sr. H.O. 44
East Cumberland H.M.C. H.O. 46
Edinburgh. Royal Hosp. for Sick Child. H.O. 46
Inverness Hosps. B.O.M. H.O. 47
Leamington Spa. Warneford Gen. H.O. 48
Llanelly. Jr. H.M.O. 48
Manchester. West Manchester H.M.C. H.O. 48
Northampton Gen. Sr. H.O. 49
Salisbury Gen. Sr. H.O. 51
Scotland. Western R.H.B. Sr. H.M.O. 41
Sheffield United Hosps. Reg. 51
Wolverhampton Hosp. M.C. H.O. 52

GERIATRICS

Liverpool R.H.B. Sr. H.M.O. 40

HÆMATOLOGY

South West Met. R.H.B. Jr. H.M.O. 42
Manchester United Hosps. Sr. H.O. 49

(continued overleaf)

INFECTIOUS DISEASES
Eastern (Fevers), E.9. Sr. H.O. .. 41
Western, S.W.6. Sr. H.O. 43
Leeds R.H.B. Reg. 47
Portslade. Foredown. Jr. H.M.O. .. 50
Portsmouth Group H.M.C. Sr. H.O. 50
Stoke-on-Trent. Bucknall Isolation. Sr. H.O. 51
York A & Tadcaster H.M.C. Sr. H.O. 53

MEDICINE
Fulham, W.6. Sr. Reg. 41
North East Met. R.H.B. Cons. .. 40
North Middlesex, N.18. H.O. .. 42
Barrow-in-Furness. North Lonsdale. Sr. H.O. 43
Birmingham United Hosps. Reg. .. 44
Bishop's Stortford & Dist. H.O. .. 44
Bradford. St. Luke's. Sr. H.O. .. 44
Bury & Rossendale H.M.C. Sr H.O. 44
Cardiff. St. David's. Sr. H.O. .. 45
Chesterfield Royal. Reg. 45
Colchester Group H.M.C. H.O. .. 45
Colchester. St. Mary's. Sr. H.O. .. 45
Douglas. Noble's. I.O.M. H.O. .. 45
Leeds United Hosps. Sr. H.O.'s .. 47
Luton & Dunstable. H.O. 48
North East Met. R.H.B. Regs. .. 42
Nottingham. Highbury. Sr. H.O. .. 50
Oxford United Hosps. Sr. H.O. .. 50
Portsmouth Group H.M.C. Sr. H.O. 50
Sheffield No. 1 H.M.C. Locum Sr. H.O. 51
Swansea. Mount Pleasant. Jr. H.M.O. 52
West Bromwich & Dist. Gen. H.O... 52

NEUROSURGERY
Aylesbury. Royal Bucks & Assoc. Hosps. M.C. Jr. H.M.O. 43
Bristol. Cossham/Frenchay H.M.C. Sr. H.O. 44
Leeds United Hosps. Reg. or Sr. H.O. 47
Liverpool. Walton. Sr. H.O. .. 47

OBSTETRICS AND GYNÆCOLOGY
North Middlesex, N.18. H.O. & Pre-reg H.O. 42
St. Bartholomew's & N.E. Met. R.H.B. Sr. Reg. 42
Tottenham Group H.M.C., N.15. H.O.'s & Locum H.O.'s 42
Birmingham R.H.B. Reg. 43
Birmingham. Sorrento Maternity. H.O. 43
Bishop's Stortford. Haymeads. H.O. 44
Blackpool. Victoria. H.O. 44
Dorking Gen. Sr. H.O. 46
Epsom Dist. Reg. 46
Griffithstown, Mon. County. Sr. H.O. 46
Manchester R.H.B. Regs. 48
Morecambe. Queen Victoria. Sr. H.O. 49
Newmarket Gen. Sr. H.O. 49
Plymouth. South Devon & East Cornwall. H.O. 50
Portsmouth Group H.M.C. H.O. .. 50
Rochford Gen. H.O. 50
Salisbury Gen. Sr. H.O. 51
South East Met. R.H.B. P.-t. Cons. 41
Stoke-on-Trent. North Staffs Royal Infy. Pre-reg. H.O. 52
Swansea. Mount Pleasant. Sr. H.O. 52
Swansea. Sr. H.O. 52
Taplow. Canadian Red Cross Mem. H.O. 52

OPHTHALMOLOGY
St. Bartholomew's, E.C.1. P.-t. Sr. Reg. 42
Bradford. Royal Eye and Ear. H.O. 44
Cardiff United Hosps. Sr. H.O. .. 45
Nottingham & Midland Eye Infy. Sr. H.O. 49
Stoke-on-Trent. North Staffs Royal Infy. Sr. H.O. 52

ORTHOPÆDICS
Hosp. for Sick Child., W.C.1. Sr. Reg. (P.-t.) 42
St. Charles', W.10. Locum Sr. H.O... 42
Alton. Lord Mayor Treloar Orth. Locum Sr. H.O. 43
Ashford, Middx. H.O. 43
Bolton Royal Infy. Sr. H.O. .. 44
Bournemouth & East Dorset H.M.C. Reg. 44
Bradford. Royal Infy. Sr. H.O. & H.O. 44
Bristol. Winford Orth. Sr. H.O. .. 44
Colchester Group H.M.C. H.O. & Locum Reg. 45
East Cumberland H.M.C. Sr. H.O. .. 46
Farnborough, Kent. Sr. H.O. .. 46
Grimsby Gen. Sr. H.O. or Locum Sr. H.O. 46
Halifax. Royal Infy. Sr. H.O. .. 47
Ipswich. East Suffolk & Ipswich. H.O. 47
Isleworth. West Middlesex. Pre-reg. H.O. 47
Leeds R.H.B. Reg. 47
Leeds United Hosps. Sr. H.O. .. 47
Leeds. Woodlands (Orth.). Sr. H.O. 47
Liverpool R.H.B. Sr. H.M.O. .. 40
Liverpool United Hosps. H.O.'s .. 47
Liverpool. Walton. Sr. H.O. .. 47
Manchester R.H.B. Reg. 48
Newcastle H.M.C. Sr. H.O... .. 49
Northampton Gen. H.O. 49
Nottingham Gen. Sr. H.O. 50
Oswestry. The Robert Jones & Agnes Hunt Orthopædic. Sr. H.O. 50
Perth. County & City of Perth Gen. Hosps. H.O.'s 50
Peterborough Mem. Sr. H.O. .. 50
Portsmouth Group H.M.C. Sr. H.O. 50
Shrewsbury. Royal Salop Infy. Sr. H.O. 51
Southampton. Royal South Hants. Sr. H.O. 51
Wolverhampton Hosp. M.C. Sr. H.O. or H.O. 52
Worcester Royal Infy. H.O. .. 53
Wrexham War Mem. Jr. H.M.O. .. 53
Yorkshire. East Riding H.M.C. Sr. H.O. 53

PÆDIATRICS
Queen Elizabeth Hosp. for Child. M.C. Sr. H.O. 42
Bournemouth & East Dorset H.M.C. Sr. H.O. 44
Bradford. Child's. H.O.'s 44
Cheltenham Gen. Eye & Child's. H.O. 45
Manchester. Duchess of York Hosp. for Babies. H.O. 49
Manchester. West Manchester H.M.C. Sr. H.O. 48
Newcastle United Hosps. Reg. & Sr. H.O. 49
Stockton-on-Tees. Child's. H.O. or Sr. H.O. 52
Watford. Shrodells. Sr. H.O. .. 52
York A & Tadcaster H.M.C. Sr. H.O. 53

PATHOLOGY
Group Pathological Lab., W.8. Sr. H.O. 41
Lambeth, S.E.11. Sr. H.O... .. 42
London Clinic, W.1. Director .. 40
Westminster, S.W.1. Sr. Reg. & Tutor 42
Birmingham United Hosps. Sr. H.O. 44
Liverpool United Hosps. Locum Sr. Reg. 48
Plymouth Clinical Area. Cons. .. 40
Reading. Royal Berkshire. H.O... 50
Romford. Oldchurch. Sr. H.O. .. 50
Sheffield R.H.B. Sr. H.M.O. .. 41
Sheffield United Hosps. Reg. or Sr. H.O. 51

PSYCHIATRY
Friern, N.11. Reg. 41
Springfield H.M.C., S.W.17. Reg. .. 42
Aylesbury. Royal Bucks & Assoc. Hosps. M.C. Jr. H.M.O. 43
Bath Clinical Area. Cons. 40
Bexley, Kent. Sr. H.O. 43
Chester. Deva (Mental). Jr. H.M.O. 45
Chesterfield H.M.C. Jr. H.M.O. .. 45
Colchester. Severalls. Jr. H.M.O. .. 45
Colchester. Severalls. Locum Sr. H.M.O. 39
Edinburgh. Royal Edinburgh Hosp. for Mental and Nervous Disorders. H.O.'s 46
Glasgow. Hawkhead (Mental). Sr. H.O. & Jr. H.M.O... 46
Greenock. Ravenscraig (Mental & General). Jr. H.M.O. 46
Leeds R.H.B. Regs. 47
Leeds. Scalebor Park. Sr. H.O. .. 47
Manchester R.H.B. Reg. 48
Newcastle R.H.B. Sr. Reg. & Regs. 49
North East Met. R.H.B. Regs. .. 42
North West Met. R.H.B. Sr. H.M.O. 40
Paisley. Dykebar Mental. Sr. H.O. or Jr. H.M.O. 50
Scotland. Northern R.H.B. Reg. .. 51
Scotland. Western R.H.B. Sr. H.M.O.'s 41
St. Albans. Shenley. Sr. H.O. .. 52
Welsh R.H.B. Reg. 53
Willerby. De la Pole. Locum Jr. H.M.O. 53
Yorkshire. East Riding H.M.C. H.O. 53
New York. Albany. Residencies .. 53

RADIOLOGY
Middlesex, W.1. Sr. Reg. 42
Ipswich. East Suffolk & Ipswich. Reg. 47
Leeds R.H.B. P.-t. Cons. 40
Plymouth Clinical Area. Cons. .. 40
Scotland. Eastern R.H.B. Locum Asst. Radiologist 41
Scotland. South-Eastern R.H.B. Reg. 51
Southampton. Royal South Hants. Reg. 51
Wolverhampton. Royal. Reg. .. 52
New Zealand. Cook Hosp. Board. Sr. or Jr. Specialist.. 41

RADIOTHERAPY
Marie Curie, N.W.3. H.O. 42
Cardiff United Hosps. Reg.. 45
Nottingham Gen. Sr. H.O. or Reg. .. 49

SURGERY
Charing Cross Hosp. Group. Reg. .. 41
London Jewish, E.1. H.O. 41
North East Met. R.H.B. Regs. .. 42
St. Nicholas, S.E.18. Sr. H.O. & H.O. 42
Aberystwyth Gen. Pre-reg. H.O. & Sr. H.O. 43
Aylesbury. Royal Bucks & Assoc. Hosps. M.C. H.O. 43
Barnstaple. North Devon Infy. H.O. 43
Bedford Gen. Pre-reg. H.O.'s & H.O. 43
Bexhill, Sussex. H.O.'s 43
Birmingham Accident Hosp. & Rehab. Centre. H.O.'s 43
Birmingham United Hosps. Reg. .. 44
Blackburn Royal Infy. H.O. .. 44
Bradford. Royal Infy. H.O. .. 45
Bury & Rossendale H.M.C. Sr. H.O. & Pre-reg. H.O. 44
Caerphilly. Sr. H.O.'s & H.O. .. 45
Chester-le-Street Gen. H.O... .. 45
Colchester Group H.M.C. Locum Reg. 45
Coventry Group 20 H.M.C. H.O. .. 45
Darlington Mem. H.O. 45
Dorchester. Dorset County. Reg. .. 46
Dovercourt. Harwich & Dist. Sr. H.O. 45
Dudley, Stourbridge & Dist. Sr. H.O.'s 46
Exeter City. Sr. H.O... 46
Farnborough, Kent. H.O. 46
Gt. Yarmouth & Gorleston Gen. H.O.'s or Sr. H.O.'s 46
Halifax. Royal Infy. H.O. 46
Harrogate Gen. H.O.'s 46
Hastings. Royal East Sussex. H.O. 46
Inverness Hosps. B.O.M. H.O. .. 47
Ipswich. Borough Gen. Pre-reg. H.O. 47
Kendal. Westmorland County. Sr. H.O. 47
Leeds United Hosps. Sr. H.O. .. 47
Lincoln County. H.O. 48
Liverpool United Hosps. H.O.'s .. 47
Llanelly. Jr. H.M.O.'s 48
Manchester. Altrincham Gen. Sr. H.O., H.O. & Reg... 48
Manchester R.H.B. Regs. 48
Manchester. West Manchester H.M.C. Sr. H.O. & H.O.'s 48
Margate Gen. Sr. H.O. 48
Newport, Mon. Royal Gwent. Sr. H.O. 49
Northampton Gen. H.O.'s 49
Nottingham City. Reg. 49
Perth. County & City of Perth Gen. Hosps. H.O. 50
Plymouth. South Devon & East Cornwall. Sr. H.O. & H.O.'s .. 50
Pontefract Gen. Infy. Sr. H.O. .. 50
Pontypool & Dist. Jr. H.M.O. .. 50
Portsmouth Group H.M.C. Sr. H.O. & Pre-reg. H.O.'s 50
Redhill County. Pre-reg. H.O. .. 50
Redhill. East Surrey. Pre-reg. H.O. 50
Salisbury Gen. Reg. 51
Scarborough. Sr. H.O. 51
Sheffield R.H.B. Locum Reg. .. 51
Sheffield R.H.B. Locum Sr. Reg. .. 51
Southport & Dist. H.M.C. Sr. H.O.'s 51
Stoke-on-Trent City Gen. Sr. H.O.'s & Pre-reg. H.O.'s 52
Tunstall. Burslem, Haywood & Tunstall War Mem. Sr. H.O. .. 52
Tynemouth Victoria Jubilee Infy. Sr. H.O. & H.O. 52
Welsh R.H.B. Reg. 53
West Bromwich & Dist. Gen. H.O. 52
Weston-super-Mare Gen. H.O. .. 52
Wolverhampton Hosp. M.C. H.O... 52
Wolverhampton. Royal. Reg. .. 52
Worcester Royal Infy. Sr. H.O. .. 52
Wrexham. Maelor Gen. H.O. .. 53
Wrexham War Mem. H.O... 53
Yorkshire. East Riding H.M.C. H.O. 53
Northern Ireland Hosps. Auth. P.-t. Cons... 41

UROLOGY
Leeds United Hosps. Sr. H.O. .. 47

VENEREOLOGY
Liverpool R.H.B. & United Hosps. Sr. H.M.O. 40

GENERAL
New York. New Rochelle. Internes 53

PUBLIC APPOINTMENTS 53

GENERAL PRACTICE 54

NON-MEDICAL 54

MISCELLANEOUS 54

The Terms and Conditions of Service of Hospital Medical and Dental Staff apply to all N.H.S. hospital posts we advertise, unless otherwise stated. Canvassing disqualifies, but candidates may normally visit the hospital by appointment.

Academic and Educational

UNIVERSITY OF LONDON

A LECTURE on "Pulmonary Changes due to Cardiac Disease" will be given by Prof. A. C. LENDRUM (St. Andrews) at 5.30 P.M. on 18TH MARCH at the London School of Hygiene and Tropical Medicine, Keppel-street, Gower-street, W.C.1.
Admission free, without ticket.
JAMES HENDERSON, Academic Registrar.

UNIVERSITY OF GLASGOW

ADMISSIONS—SESSION 1954–55
Notice is hereby given that the number of applicants who may be admitted to the following Faculties is limited :—
FACULTY OF ARTS.
FACULTY OF LAW.
FACULTY OF MEDICINE (including Dentistry and Veterinary Medicine).
FACULTY OF SCIENCE.
FACULTY OF ENGINEERING.
All those who intend to enter any of these faculties for the first time in OCTOBER, 1954, must obtain from the undersigned forms of application for admission. The forms are available now and should be returned as follows :—
Faculty of Medicine (including Dentistry and Veterinary Medicine) 15th May.
All other Faculties 31st May.
Any applicant who wishes to have a form sent by post should enclose a stamped addressed envelope.
ROBT. T. HUTCHESON, Registrar.

INSTITUTE OF NEUROLOGY
(Queen Square)

2 COURSES OF CLINICAL DEMONSTRATIONS, open to post-graduates, will be held at The National Hospital, Queen-square, on WEDNESDAYS at 4 P.M., from 31ST MARCH to 16TH JUNE, 1954, inclusive, and on SATURDAYS at 10.30 A.M., from 27TH MARCH to 19TH JUNE, 1954, inclusive.
The fee for attending either of these courses is 1 guinea.
Application for a ticket should be made to the Dean, Institute of Neurology (Queen Square), The National Hospital, Queen-square, W.C.1, and a remittance to cover the fee enclosed. Only postal applications will be considered.

WORLD HEALTH ORGANIZATION FELLOWSHIPS

A small number of Fellowships is to be awarded in 1955 for study in European countries by the World Health Organization to Registered Medical Practitioners, Dental Practitioners and State Registered Nurses of at least 5 years standing who are engaged in the Health Services, Medical Education or Medical Research in the United Kingdom.
Fellowships will be of 2 kinds :—
(1) Resident Fellowships for a period which will not exceed 4 months.
(2) Travelling Fellowships of shorter duration for senior persons holding responsible appointments.
Applications giving full particulars of qualifications, experience, proposed programme and duration of study, and accompanied by the names of 2 referees, should be sent :—
(*a*) By those resident in Scotland to the Secretary, Department of Health for Scotland, St. Andrew's House, Edinburgh, 1 ; and
(*b*) By others to the Secretary, Ministry of Health, Savile-row, London, W.1.
Envelopes should be marked "World Health Organization Fellowships." Applications must be received on or before 13th April, 1954.

THE ROYAL SOCIETY

UNITED STATES (F.O.A.) RESEARCH FELLOWSHIPS
Applications are invited for United States (F.O.A.) Research Fellowships, tenable for 2 years in American research institutions. The period of tenure may be less than 2 years but not less than 1 year, and other things being equal preference will be given to candidates who can go for 2 years. The Fellowships are open for award to British Scientists normally resident in the United Kingdom who propose to do research in the natural sciences and in the engineering, agricultural, and medical sciences, but excluding clinical medicine. Successful candidates, who will mostly be between 26 and 32 years of age and who will be required to undertake to return to resume scientific work in the United Kingdom on completion of tenure of Fellowships, will be placed in American Universities to participate with American colleagues in current fundamental scientific research as closely as possible related to their own fields of interest. Candidates must possess a doctoral degree in science or have equivalent experience. The Fellowships provide travel, pay at the rate of $9 a day in the United States, and certain other allowances.
Application should be made before 31st March, 1954, to the Assistant Secretary, The Royal Society, Burlington House, London, W.1, from whom fuller particulars and forms of application may be obtained. The number of Fellowships is now limited and it is possible that no further applications will be invited after 31st March, 1954.

INSTITUTE OF CHILD HEALTH. University of London. Applications are invited for the post of ASSISTANT to the Nuffield Professor of Child Health, vacant on 1st June, 1954. The duties, which include teaching and research, will be divided between The Hospital for Sick Children, Great Ormond-street, and the Queen Elizabeth Hospital for Children. Applicants should have had experience in a Senior Registrar post. The appointment in the first instance is for 1 year, renewable for further periods up to 3 years. Salary £1300 rising to £1500.
Applications, including the names of 2 referees, should be sent to the undersigned not later than 10th April, 1954.
G. H. NEWNS, Dean, The Institute of Child Health.
The Hospital for Sick Children, Great Ormond-street, W.C.1.

RESEARCH INSTITUTE OF THE HOSPITAL FOR SICK CHILDREN
TORONTO, CANADA

RESEARCH FELLOWSHIP IN VIRUS INFECTIONS
Applications invited from medical graduates (Male or Female) with training in laboratory methods and some interest in pædiatrics. Duties will consist chiefly of investigation of virus infections by tissue-culture methods. Work will be carried out in the Virus Research Department under the direction of Dr. A. J. Rhodes. Post vacant 1st April, 1954. Starting salary $5500. Preference given to person prepared to work for 2-year period.
Applications, with names and addresses of 2 referees, to be submitted (air-mail) immediately to—
Dr. A. J. RHODES, Director, Research Institute.
The Hospital for Sick Children, Toronto, Canada.

L.M.S.S.A.

FINAL EXAMINATION : SURGERY, 12th April, 10th May, 14th June, 1954. MEDICINE, PATHOLOGY, 19th April, 17th May, 21st June, 1954. MIDWIFERY, 20th April, 18th May, 22nd June, 1954. MASTERY OF MIDWIFERY, May and November. DIPLOMA IN INDUSTRIAL HEALTH, July and December.
For regulations apply REGISTRAR, Apothecaries' Hall, Black Friars-lane, London, E.C.4.

BRITISH EMPIRE CANCER CAMPAIGN invites applications from suitably qualified British subjects for EXCHANGE FELLOWSHIPS IN CANCER RESEARCH during 1954–55. Fellowships are of 1 years tenure in the United States of America at a stipend of $4000 p.a., which will be paid by the American Cancer Society. Travelling expenses to and from centre of work will be borne by the Campaign.
For further particulars and application forms apply to the Secretary-General, British Empire Cancer Campaign, 11, Grosvenor-crescent, Hyde Park Corner, London, S.W.1. The closing date for the receipt of applications is 1st April, 1954.

THE MEDICAL RESEARCH COUNCIL have a vacancy in their Radiotherapeutic Research Unit at Hammersmith Hospital for a RADIOTHERAPIST. Grading and salary according to qualifications and experience.
Applications to reach the Director, Radiotherapeutic Research Unit, Hammersmith Hospital, Ducane-road, London, W.12, by 9th April, 1954.

THE RESEARCH INSTITUTE OF THE HOSPITAL FOR SICK CHILDREN, TORONTO, CANADA. RESEARCH FELLOWSHIP IN NEUROLOGY. Applications invited from medical graduates (Male or Female) with training in pædiatrics or neurology. Duties will consist chiefly of investigation of convulsive disorders in young children by clinical and laboratory methods, under the direction of Dr. J. S. Prichard. Post vacant 1st May, 1954. Salary $5000. Preference given to persons prepared to work for a 2-year period.
Applications, with names and addresses of 2 referees, to be submitted (air-mail) immediately to Dr. A. J. RHODES, Director, The Research Institute, The Hospital for Sick Children, 555, University-avenue, Toronto, Canada.

UNIVERSITY OF LONDON. The Senate invite applications for the CHAIR OF CHEMICAL PATHOLOGY tenable at St. Mary's Hospital Medical School (salary within the range £2250–£2750 a year).
Applications (10 copies) must be received not later than 3rd May, 1954, by the Academic Registrar, University of London, Senate House, W.C.1, from whom further particulars should be obtained.

UNIVERSITY OF BELFAST. The Senate of the Queen's UNIVERSITY OF BELFAST invites applications for a LECTURESHIP IN BIOCHEMISTRY from 1st October, 1954. Salary range £550–£50–£850, and on certain conditions being fulfilled to £1150, plus contributory pension rights under the F.S.S.U. Initial placing on the scale £550–£850 is dependent on experience and qualifications.
Applications should be received by 30th April, 1954. Further particulars may be obtained from G. R. COWIE, M.A., LL.B., Secretary.

UNIVERSITY OF GLASGOW. Applications are invited for a LECTURESHIP IN BACTERIOLOGY (medical) at the Western Infirmary, Glasgow. The Lecturer will also be an Assistant Bacteriologist to the Infirmary. The appointment will be whole-time and the stipend will be between £1000 and £1500. Initial salary will be fixed according to experience and qualifications.
Applications (14 copies), should be lodged not later than 3rd April, 1954, with the undersigned, from whom further particulars may be obtained.
ROBT. T. HUTCHESON, Secretary of University Court.

UNIVERSITY COLLEGE OF THE WEST INDIES. Applications are invited for a SENIOR LECTURESHIP IN PÆDIATRICS. Duties will include clinical work in the University College Hospital and instruction of students working for medical degrees of the University of London. Salary scale £1300–£50–£1800 p.a. ; point of entry determined by qualifications and experience. Child allowance. F.S.S.U. Unfurnished accommodation at rental of 5% of basic salary. The successful applicant to take up the post during July, 1954.
Applications (10 copies), detailing qualifications and experience and naming 3 referees, should be received before 31st March, 1954, by the Secretary, Senate Committee on Higher Education in the Colonies, University of London, Senate House, London, W.C.1, from whom further particulars may be obtained.

Hospital Services : Senior Appointments

COLCHESTER. SEVERALLS HOSPITAL. Locum ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer grade) required for at least 6 months. Must be experienced in modern treatment. Salary 31½ guineas per week. Single accommodation available.
Applications to Medical Superintendent.

LONDON CLINIC. (174 Beds.) Applications are invited for the post of DIRECTOR of the Department of Pathology. Applicants must be registered medical practitioners with a wide experience in pathology. The successful candidate will be required to join a contributory superannuation scheme if not already a member. There will be ample security of tenure of the appointment; commencing salary will depend on qualifications and experience but will be not less than £2500 p.a.

Applications, stating age, qualifications, and details of past and present appointments, together with the names of 3 referees, should be forwarded to the Secretary, London Clinic, Devonshire-place, London, W.1, not later than 10th April next.

AMENDED ADVERTISEMENT

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

Full or maximum Part-time CONSULTANT PHYSICIAN, Whipps Cross Hospital, E.11.

Applications (6 copies), detailing private address, date of birth, qualifications and experience, present appointment(s) (including number of sessions), and grade, and names of 3 referees, should reach the Secretary, 11A, Portland-place, London, W.1, by Saturday, 27th March.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) CONSULTANT ANÆSTHETIST (7/11ths) Central Middlesex Hospital, N.W.10 (726 Beds).

Detailed applications by 6th April, 1954.

(2) Whole-time ASSISTANT PSYCHIATRIST, Cell Barnes Hospital, St. Albans (676 Beds), to act as Deputy Medical Superintendent. D.P.M. and/or equivalent mental deficiency experience. Salary scale £1300 (at age 32 years)–£1750.

Detailed applications by 10th April, 1954.

(3) ASSISTANT PHYSICIAN (whole-time), Colindale Hospital, The Hyde, N.W.9. Hospital has 240 Beds for treatment of pulmonary tuberculosis. Candidates should have good general medical experience and special experience in treatment of pulmonary tuberculosis. Salary scale £1300 (at age 32)–£1750.

Detailed applications by 20th April, 1954.

Hospitals may be visited by direct appointment.

Applications (3 referees) to Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

BATH CLINICAL AREA. South-Western Regional HOSPITAL BOARD. Appointment of Deputy Physician Superintendent to Mendip Hospital, Wells. Applications are invited from registered medical practitioners for the whole-time appointment of CONSULTANT PSYCHIATRIST to the Bath Clinical Area, which comprises Bath, North-East Somerset, Mid and West Wilts. Applicants should have had wide experience in psychiatry, and must possess the Diploma in Psychological Medicine. The duties of the successful candidate, who will have charge of beds at Mendip Hospital, Wells, and act as Deputy Physician Superintendent of this Hospital, will be subject to the general administrative supervision of the Physician-Superintendent. In addition, he will be required to visit other hospitals in the Bath and Bristol Clinical Areas as determined by the Regional Board from time to time. A house is being erected for the successful candidate.

Applications (12 copies), stating date of birth, qualifications and experience, together with 12 copies of 2 testimonials, and the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 31st March, 1954.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. CONSULTANT DERMATOLOGIST, Ipswich Hospitals area. Main hospitals East Suffolk and Ipswich and Borough General, Ipswich. Duties include responsibility for Venereal Disease Clinics at Ipswich and Bury St. Edmunds. Higher qualifications and wide experience in dermatology and venereal diseases necessary. Appointment for the equivalent of 8 notional half-days with probable increase to maximum part-time (or whole-time if desired) at a later date.

Detailed applications (8 copies), including age, to Secretary of Board, 117, Chesterton-road, Cambridge, by 22nd March, 1954.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. ASSISTANT ANÆSTHETIST (whole-time), Norfolk and Norwich Hospital Group. Duties will include approximately 2 sessions per week at Lowestoft and North Suffolk Hospital. Higher qualification and wide experience essential. Salary scale £1300–£1750.

Detailed applications (8 copies), including age, to Secretary of Board, 117, Chesterton-road, Cambridge, by 22nd March, 1954. Candidates invited to visit the hospitals concerned by direct arrangement with Hospital Management Committee Secretary, Norfolk and Norwich Hospital, Norwich.

LEEDS REGIONAL HOSPITAL BOARD. Whole-time SENIOR HOSPITAL MEDICAL OFFICER in Thoracic Medicine for the Middleton, Bradford A and Leeds B Management Committee Groups. The person appointed will be a member of a team concerned with the surgical treatment of tuberculosis in sanatoria and chest hospitals and will be expected to devote special attention to the aftercare of tuberculous thoracic surgical cases. Extensive experience in tuberculosis and chest radiography is essential and previous experience in a thoracic surgical unit is desirable.

Applications (10 copies), stating age, qualifications and details of appointments held showing dates, with names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, not later than 9th April, 1954.

LEEDS REGIONAL HOSPITAL BOARD. Part-time CONSULTANT in Radiology (7 sessions per week). The successful applicant will be required to undertake 4 sessions per week at the Harrogate General Hospital and 3 sessions per week at hospitals in Leeds.

Applications (12 copies), stating age, qualifications and details of appointments held showing dates, with names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, not later than 27th March, 1954.

LIVERPOOL REGIONAL HOSPITAL BOARD. United LIVERPOOL HOSPITALS. Applications are invited for the post of ASSISTANT VENEREOLOGIST with whole-time duties at the Liverpool Royal Infirmary and Newsham General Hospital. The successful candidate will work under the general direction of the Consultant Venereologists. Applicants should possess a higher qualification and previous experience in venereology is essential. Salary £1300 (at age 32)–£50–£1750 p.a.

Forms of application from and to be returned to Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 3rd April, 1954.

VINCENT COLLINGE, Secretary to the Board.

LIVERPOOL REGIONAL HOSPITAL BOARD. Newsham GENERAL AND PARK HOSPITALS. Applications are invited for the post of Whole-time ASSISTANT PHYSICIAN (geriatrics) with duties at the above hospitals. The person appointed will be required to assist the Consultant Physicians in the geriatric work in the hospitals named above. Newsham General Hospital contains the Primary Geriatric Unit for the Region and 95 Beds will be opened in the near future at Park Hospital (this number of beds will be expanded later). The successful applicant will be required to take up his duties as soon as possible and to undertake some medical administrative duties in relation to the developments at Park Hospital. Married accommodation is available if required. Salary £1300 (at age 32)–£50–£1750 p.a.

Forms of application from and to be returned to Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 3rd April, 1954.

VINCENT COLLINGE, Secretary to the Board.

LIVERPOOL REGIONAL HOSPITAL BOARD. 1. BIRKENHEAD GROUP. 2. WARRINGTON GROUP. Applications are invited for 2 posts of Whole-time SENIOR CASUALTY OFFICER with duties mainly at—

(1) Birkenhead General Hospital.

(2) Warrington Infirmary.

The successful candidates should possess a higher qualification in surgery and will be required to take charge of the Casualty Departments and work under the General Supervision of the Consultant Surgeons and Orthopædic Surgeons in the Group. The appointment will be for a period not exceeding 4 years. Salary within the range £1300–£50–£1750 for candidate of 32 years and over and £1200–£50–£1750 for candidate aged 30 years and less.

Forms of application from and to be returned to Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 3rd April, 1954.

VINCENT COLLINGE, Secretary to the Board.

LIVERPOOL REGIONAL HOSPITAL BOARD. North LIVERPOOL AREA. Applications are invited for the post of Whole-time ASSISTANT ORTHOPÆDIC SURGEON with duties mainly at Walton and Bootle Hospitals. Salary £1300–£50–£1750 p.a. The successful applicant will work under the direction of the Consultant Orthopædic Surgeon. Preference will be given to candidates possessing a higher qualification.

Forms of application from and to be returned to Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 3rd April, 1954.

VINCENT COLLINGE, Secretary to the Board.

PLYMOUTH CLINICAL AREA. South-Western Regional HOSPITAL BOARD. Applications are invited from registered medical practitioners for the appointment of Whole-time CONSULTANT PATHOLOGIST in the Plymouth Clinical Area. Applicants will be expected to possess a higher medical qualification, and special experience in hæmatology is desirable. The successful candidate will work mainly at the South Devon and East Cornwall Hospital, Plymouth, but will be required to visit hospitals and clinics in the Area as may be necessary from time to time. In matters of policy and principle, he will act under the general direction of the Area Pathologist at Plymouth, who is responsible for the coördination of the Laboratory Services in the Area.

Applications (12 copies), stating date of birth, qualifications and experience, together with 12 copies of 2 testimonials, and the names and addresses of 2 referees should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 31st March, 1954.

PLYMOUTH CLINICAL AREA. South-Western Regional HOSPITAL BOARD. Applications are invited from registered medical practitioners for the appointment of ASSISTANT RADIOLOGIST in the Plymouth Clinical Area, which comprises Plymouth, Kingsbridge, Tavistock, Launceston, Bude, and Liskeard. The appointment will be on a whole-time basis in the Senior Hospital Medical Officer grade. Applicants should have had wide experience in radiology, and possession of the Diploma in Medical Radiology is essential. The successful candidate will be required to work under the general direction of the Consultant Radiologists mainly at the South Devon and East Cornwall Hospital, Plymouth, but may be required to work at other hospitals in the Clinical Area as determined by the Regional Board from time to time.

Applications (12 copies), stating date of birth, qualifications and experience, together with 12 copies of 2 testimonials, and the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 31st March, 1954.

SHEFFIELD REGIONAL HOSPITAL BOARD. CONSULTANT ANÆSTHETIST required for 8 notional half-days per week at the Royal Hospital, Chesterfield (257 Beds) and the Victoria Hospital, Worksop (127 Beds).

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 10th April, 1954.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT PATHOLOGIST to the Leicester Royal Infirmary with duties also at the Leicester Isolation Hospital and Chest Unit. Salary £1300–£50–£1750. Candidates must have experience in all branches of laboratory work, experience in morbid histology would be an advantage.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 10th April, 1954.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Part-time CONSULTANT OBSTETRICIAN AND GYNÆCOLOGIST for 9 notional half-days a week in the South East Kent Group of hospitals. Candidates must have had wide experience in obstetrics and gynæcology and be Members of the Royal College of Obstetricians and Gynæcologists. The possession of other higher qualifications is desirable. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales). Candidates may visit the hospitals concerned.

Apply, stating nationality, age, qualifications and experience, including details of present appointment and war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 27th March, 1954.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. Radiodiagnosis. Locum ASSISTANT RADIOLOGIST for Perth Royal Infirmary (272 Beds) and Bridge of Earn Hospital (806 Beds) for June/July or July/August. Living-in accommodation available for a single person. Remuneration according to qualifications and experience.

Applications, with full details, stating period preferred, and names of 2 referees, to the Secretary of the Board, "Braeknowe," 430, Blackness-road, Dundee, not later than 3rd April, 1954.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of ASSISTANT ANÆSTHETIST, based on the Inverness Hospitals. Salary scale is £1300–£50–£1750 p.a. Candidates should have a Diploma in Anæsthetics.

Schedules of application and further particulars may be obtained from the undersigned, with whom applications should be lodged by 31st March, 1954.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments :—

Whole-time ASSISTANT PSYCHIATRIST AND DEPUTY PHYSICIAN SUPERINTENDENT, Riccartsbar Mental Hospital, Paisley. A house will be available shortly. Salary on the scale £1300–£50–£1750.

Whole-time ASSISTANT E.N.T. SURGEON based at the County Hospital, Stonehouse, and with duties at other hospitals and clinics in the Lanark County Area. Salary on the scale £1300–£50–£1750.

Whole-time ASSISTANT PSYCHIATRIST, Argyll and Bute Mental Hospital, Lochgilphead. Flat available in the Hospital. Salary on the scale £1300–£50–£1750.

These appointments are subject to the National Health Service (Scotland) superannuation regulations.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, not later than 30 days after the publication of this advertisement.

NORTHERN IRELAND HOSPITALS AUTHORITY invite applications for a post as CONSULTANT THORACIC SURGEON at hospitals managed by the Belfast, South Belfast and Forster Green Hospital Management Committees and at Whiteabbey Chest Hospital. The appointment will be on a part-time basis of 9 half-days of duty weekly. The terms and conditions of the appointment will be in accordance with the Authority's application of the Spens Report to Northern Ireland.

Applications should be made on a form which may be obtained (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, Victory Buildings, 44–46, Queen-street, Belfast, and will be received not later than 13th April, 1954.

NORTHERN IRELAND HOSPITALS AUTHORITY invite applications for the post as SECOND CONSULTANT SURGEON at hospitals managed by the South Antrim Hospital Management Committee. The post will be on a part-time basis of 8 half-days of duty weekly. The terms and conditions of the appointment will be in accordance with the Authority's application of the Spens Report to Northern Ireland.

Applications should be made on a form which may be obtained (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, Victory Buildings, 44–46, Queen-street, Belfast, and will be received not later than 13th April, 1954.

NEW ZEALAND. COOK HOSPITAL BOARD, Gisborne, NEW ZEALAND. Applications are invited from registered medical practitioners for the appointment of a RADIOLOGIST with the above Board. Salary in accordance with the Hospital Employment Regulations salary rates for the following gradings :

Senior Specialist : £1690–£1940.
Junior Specialist : £1290–£1590.

The amounts quoted are in New Zealand currency and the position is non-resident. Gisborne, with a population of 21,000, is situated on the sea coast and enjoys an ideal climate. Conditions of appointment will be supplied on application to the High Commissioner for New Zealand, 415, Strand, London, W.C.2, mentioning this paper and quoting reference number 3/65/11.

Completed applications to be sent direct by air mail to the Secretary, Cook Hospital Board, Gisborne, New Zealand, to arrive not later than Wednesday, 31st March, 1954.

Hospital Services : Junior Appointments

BATTERSEA GENERAL HOSPITAL, Battersea Park, S.W.11. CASUALTY OFFICER/HOUSE SURGEON (resident). House Officer or Senior House Officer grade according to experience. Vacant mid-April.

Apply, enclosing copies of 2 recent testimonials, to Hospital Secretary (L).

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT SENIOR HOUSE OFFICER required for Casualty Department. Successful candidate will work under supervision of Orthopædic and Traumatic Specialist. Preference given to applicant who has held resident surgical and medical posts in general hospitals. Post vacant 26th April, 1954. Appointment for 6 months subject to renewal for further 6 months.

Applications, with names of 2 referees or copies of 2 testimonials, to Medical Director by 20th March, 1954.

CHARING CROSS HOSPITAL GROUP. Applications are invited for the post of SURGICAL REGISTRAR (resident) tenable at Wembley Hospital for 1 year in the first instance from 1st June, 1954. Candidates should hold the Diploma of F.R.C.S. Salary and conditions in accordance with terms of service of hospital medical staff and subject to deduction for board-residence.

Applications, with copies of testimonials, should be sent to the undersigned by 24th April, 1954.

FRANK HART, Esq., D.P.A., F.H.A., Secretary to the Board.
Charing Cross Hospital, London, W.C.2.

DREADNOUGHT SEAMEN'S HOSPITAL, Greenwich, S.E.10. There is an immediate vacancy for CASUALTY AND RECEIVING-ROOM OFFICER (resident or non-resident). Salary £670 p.a. Post recognised by the Royal College of Surgeons.

Applications, stating age, qualifications and experience, together with the names of 3 referees, should be sent to the undersigned as soon as possible, and not later than Wednesday, 17th March. F. A. LYON, Secretary.

Dreadnought Seamen's Hospital, London, S.E.10.

EASTERN HOSPITAL (Fevers), Homerton-grove, London, E.9. Applications for the post of SENIOR HOUSE OFFICER (deduction £130 p.a. for residence) should be sent to the Group Secretary, Hackney Hospital, London, E.9, with copies of 3 testimonials. The post is for 1 year in the first instance; duties of successful candidate may include some work in the Chest Unit.

FRIERN HOSPITAL, New Southgate, N.11. (2470 Beds.) PSYCHIATRIC REGISTRAR required at above Hospital. Candidates should have adequate general medical and psychiatric experience. Details of the appointment and work in the Hospital may be obtained from the Physician-Superintendent and applicants are invited to visit the Hospital by appointment.

Application forms obtainable from the Secretary, Friern Hospital, New Southgate, N.11. Application forms must be returned by NOON on 1st April, 1954.

FULHAM HOSPITAL, St. Dunstan's-road, Hammersmith, W.6. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. FULHAM AND KENSINGTON HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for appointment as SENIOR MEDICAL REGISTRAR (now vacant) at above Hospital. Post is open to persons in their fourth or subsequent year as Senior Registrars in the specialty, and those who though not now holding posts as Senior Registrars have occupied such posts for 3 or more years and have vacated them since 6th November, 1950. Post will be tenable for 1 year, with a possible extension until not later than 31st December, 1955. Candidates may visit the Hospital by arrangement with the Physician-Superintendent.

Applications (5 copies to be completed), to be submitted by 26th March, 1954, on forms obtainable from the Group Secretary (L.174), Fulham and Kensington Hospital Management Committee, 5, Collingham-gardens, London, S.W.5.

GROUP PATHOLOGICAL LABORATORY at St. Mary ABBOTS HOSPITAL, Marloes-road, Kensington, W.8. FULHAM AND KENSINGTON HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (pathology) required for duty in first instance at the Group Laboratory. Post vacant 1st April, 1954. Resident post, and residence may be required at any of the hospitals in the Group.

Applications to be submitted within 10 days on forms obtainable from the Hospital Secretary (L.175), St. Mary Abbots Hospital, Marloes-road, Kensington, W.8.

HACKNEY HOSPITAL, London, E.9. (General—844 Beds.) Applications for the 6 months appointment of CASUALTY OFFICER AND E.N.T. HOUSE SURGEON (House Officer grade), vacant immediately, should reach the Group Secretary, Hackney Hospital, E.9, as soon as possible, quoting reference HH/CO.

HIGHLANDS GENERAL HOSPITAL, Winchmore-hill, London, N.21. ANÆSTHETIST (House Officer grade), resident, required. 100 active surgical and orthopædic beds. Approximately 1200 operations annually.

Applications, with copies of 3 testimonials, to Hospital Secretary.

LONDON JEWISH HOSPITAL, Stepney Green, E.1. Applications invited for the post of RESIDENT HOUSE SURGEON, vacant 6th April, 1954. Tenable for 6 months, renewable. Salary £350, £400, or £450 p.a. according to experience, subject to deduction at the rate of £100 for board, lodging, &c. Available as pre-registration appointment.

Applications, with copies of testimonials, to the Secretary at the Hospital.

LAMBETH HOSPITAL, Brook-drive, S.E.11. Applications are invited for the appointment as RESIDENT CASUALTY OFFICER from 5th April, 1954. The position is graded as Senior House Officer, or House Officer, according to experience, and is recognised for the F.R.C.S.

Forms of application from the Physician-Superintendent.

LAMBETH HOSPITAL, Brook-drive, S.E.11. Applications are invited from registered medical practitioners for the appointment of RESIDENT CLINICAL PATHOLOGIST at above Hospital, vacant 1st May, 1954. The post is of Senior House Officer status and the appointment will be for a period of 1 year. Previous experience in pathology is not essential and the appointment presents opportunities for gaining experience in all branches of clinical pathology.

Form of application can be obtained from the Secretary.

LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST. A vacancy occurs 1st May, 1954, for RESIDENT SURGICAL OFFICER. Appointment for 6 months with prospect of renewal. Post graded as Senior House Officer or Registrar according to qualifications and experience. Previous surgical experience necessary.

Applications, stating age, qualifications with dates, and previous appointments held, should reach the undersigned not later than 30th March, 1954.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

MARIE CURIE HOSPITAL, 66, Fitzjohn's-avenue, Hampstead, N.W.3. Applications are invited from registered medical practitioners for the post of GYNÆCOLOGICAL HOUSE SURGEON (radiotherapy), vacant April, 1954.

Applications with copies of testimonials to the Medical Director.

MIDDLESEX HOSPITAL, W.1. Applications invited for the post of SENIOR REGISTRAR in the Department of X-ray Diagnosis.

Forms of application obtainable from the Deputy Superintendent and should be submitted, naming 3 referees, by 3rd April.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. 2 OBSTETRIC AND GYNÆCOLOGICAL HOUSE SURGEONS (resident) required for 1st May.

(*a*) Registered medical practitioner.

(*b*) Pre-registration (second post).

Both posts recognised by the R.C.O.G. for Diploma, and as a combined post for Membership. Candidates must have held house appointments in either medicine or surgery. Large Obstetric and Gynæcological Department.

Applications, stating age, qualifications, experience, nationality, with copies of recent testimonials, to Secretary of Hospital by 23rd March.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. HOUSE PHYSICIAN (resident) required for 1st May. General medicine. Approved as pre-registration post (first or second).

Applications, stating age, qualifications, experience, nationality, with copies of recent testimonials, to Secretary of Hospital by 23rd March.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) SURGICAL REGISTRARS (2 posts) (non-resident), Whipps Cross Hospital, Leytonstone, E.11.

(2) SURGICAL REGISTRAR (resident), St. Mary's Hospital, Plaistow, E.13. Preference given to holders of F.R.C.S.

(3) Casualty Department REGISTRAR (resident), Oldchurch Hospital, Romford, Essex.

(4) MEDICAL REGISTRAR (Admission Unit) (resident), Oldchurch Hospital, Romford, Essex.

(5) MEDICAL REGISTRAR (resident), St. Andrew's Hospital, Billericay, Essex.

(6) REGISTRAR in Psychiatry (resident or non-resident), Severalls Hospital, Colchester, Essex.

(7) REGISTRAR in Psychiatry (resident or non-resident), Claybury Hospital, Essex. Post recognised for D.P.M. facilities afforded as far as possible for attendance at lectures and demonstrations in connection with the D.P.M. Previous experience in general hospitals and in psychiatry necessary.

(8) REGISTRAR in Pulmonary Tuberculosis (resident), Harts Hospital, Woodford Green, Essex. Post offers exceptional opportunities for experience in tuberculosis and diseases of the chest. The Hospital includes Area Chest Clinic and Thoracic Surgical Unit. Hospital easily accessible to London by tube or bus.

Appointments subject to review after 1 year.

Separate applications in duplicate, detailing date of birth, qualifications, experience, present appointment, grade and salary, with 2 copies of 2 recent testimonials, to Secretary, 11A, Portland-place, W.1, by 27th March, 1954.

QUEEN ELIZABETH HOSPITAL FOR CHILDREN MANAGEMENT COMMITTEE, Hackney-road, London, E.2, Shadwell, E.1, and BANSTEAD WOOD, SURREY. Applications are invited for the appointment of RESIDENT MEDICAL OFFICER (Male or Female) at Shadwell, E.1 (Senior House Officer grade), to become vacant on 1st June, 1954. Candidates must have had experience in the treatment of sick children. The appointment will be for 1 year.

Application forms may be obtained from the Secretary at Hackney-road, and should be returned, with not more than 3 testimonials, not later than 29th March, 1954.

ROYAL NORTHERN HOSPITAL, Holloway, N.7. Applications are invited for 2 posts of CASUALTY OFFICER (House Officer grade), with some duties either in the E.N.T. or the Ophthalmological Department. Posts recognised for F.R.C.S.

Applications to be sent to the Hospital Secretary by 20th March, 1954.

ST. BARTHOLOMEW'S HOSPITAL AND NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for a post of SENIOR REGISTRAR in Gynæcology and Obstetrics to be held for 4 years, as far as possible in equal parts at St. Bartholomew's Hospital and the North Middlesex Hospital, N.18, subject to annual re-election.

Applications, with the names of 3 referees, should be sent to the undersigned by Saturday, 27th March.

C. C. CARUS-WILSON, Clerk to the Governors.

St. Bartholomew's Hospital, E.C.1.

ST. BARTHOLOMEW'S HOSPITAL, E.C.1. Applications are invited for a post of SENIOR REGISTRAR in E.N.T. Surgery tenable for 4 years, subject to annual re-election.

Applications, with the names of 3 referees, should be submitted to the undersigned by Saturday, 27th March.

C. C. CARUS-WILSON, Clerk to the Governors.

ST. BARTHOLOMEW'S HOSPITAL, E.C.1. Applications are invited for a post of Part-time SENIOR REGISTRAR in the Ophthalmic Department to work 5 half-days a week (Monday and Thursday mornings, Tuesday and Friday afternoons and 1 half-day to be arranged), tenable for 4 years subject to annual re-election.

Applications, with the names of 3 referees, should be submitted to the undersigned by Saturday, 27th March.

C. C. CARUS-WILSON, Clerk to the Governors.

ST. CHARLES' HOSPITAL, Ladbroke-grove, W.10. 4 Locum Tenens SENIOR HOUSE OFFICERS required for the following specialties :—

(*a*) Tuberculosis (2).

(*b*) Thoracic (1).

(*c*) Orthopædic, E.N.T. Ophthalmology, &c. (1).

Apply immediately to Hospital Secretary.

ST. CHARLES' HOSPITAL, Ladbroke-grove, W.10. Applications are invited for the post of HOUSE PHYSICIAN (tuberculosis). The post provides excellent experience in medical and surgical treatment of pulmonary tuberculosis and facilities for investigation of non-tuberculosis pulmonary diseases.

Applications, stating age, qualifications, experience, together with the names and addresses of 2 referees, to be forwarded to the Hospital Secretary immediately.

ST. NICHOLAS HOSPITAL, Tewson-road, Plumstead, S.E.18. SENIOR HOUSE OFFICER (general surgery and orthopædics), vacant now. Recognised for F.R.C.S. 6-month appointment in the first instance. Salary £670 p.a., less £150 p.a. for residence.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ST. NICHOLAS HOSPITAL, Tewson-road, Plumstead, S.E.18. HOUSE SURGEON (recognised for F.R.C.S.), vacant 17th April. Approved for Pre-registration Service.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Whole-time JUNIOR HOSPITAL MEDICAL OFFICER for the Blood Transfusion Service in the South West and South East Metropolitan Regions. Duties will be divided equally between blood collection from donors in the area covered by the S.W. and S.E. Metropolitan Regional Hospital Boards and laboratory work, including research, at the South London Blood Transfusion Centre, Stanley-road, Sutton, Surrey. The appointment offers ample scope in serology and hæmatology and all aspects of blood transfusion. Blood collection entails about 3 sessions only per week. Salary scale £700–£50–£1000 p.a.

Applications (2 copies), giving date of birth, qualifications experience and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 27th March, 1954. Applicants may visit Blood Transfusion Centre by arrangement with the Medical Director there.

SPRINGFIELD HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required. The Hospital is a large one and offers excellent experience in diagnosis and treatment of all forms of mental disorder including the neuroses. Every variety of modern treatment is carried out in a well-equipped treatment centre. Single accommodation available, for which a deduction of £130 p.a. will be made. Candidates may visit the Hospital by arrangement.

Apply to Secretary, Springfield Hospital, Beechcroft-road, Upper Tooting, S.W.17, for application forms which should be returned, duly completed, on or before 27th March, 1954.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There is a vacancy for a Part-time NON-RESIDENT SENIOR REGISTRAR to the Orthopædic Department (5½ sessions per week).

Full particulars and form of application, which must be returned not later than Monday, 5th April, 1954, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

TOTTENHAM GROUP HOSPITAL MANAGEMENT COMMITTEE, N.15. RESIDENT OBSTETRIC HOUSE OFFICERS (third post) required at the Stoke Newington, N.16, and Hampton Court Units of the Bearsted Memorial Hospital (Jewish Maternity Hospital) :—

(*a*) Locum appointments. Stoke Newington Unit : 2nd–19th April and 1st May–30th June, 1954. Hampton Court Unit : 17th–30th June, 1954.

(*b*) 6-month appointments. Stoke Newington and Hampton Court Units : 2 vacancies, 1st July–31st December, 1954.

Previous obstetric experience an advantage. Posts recognised for the D.Obst.R.C.O.G. Applicants can be considered for appointment under (*a*) and (*b*).

Application forms from the Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, which should be returned immediately.

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1. Applications invited for post of SENIOR REGISTRAR AND PATHOLOGY TUTOR to Department of Chemical Pathology for 1 year in first instance from 1st May, 1954. Candidates should have had at least 3 years experience in pathology, including some biochemistry. Duties include the biochemical investigation of hospital patients, teaching and research. Further details obtainable from Professor of Chemical Pathology.

Applications (6 copies), with names of 2 referees, to House Governor by 27th March.

WESTERN HOSPITAL, Seagrave-road, Fulham, S.W.6. A HOSPITAL OF THE FULHAM AND KENSINGTON HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required; primarily for infectious diseases, but also for Tuberculosis Unit. The Hospital serves as a Poliomyelitis Centre. Resident appointment.

Applications to be submitted immediately on forms obtainable from Hospital Secretary (L.172).

WOOLWICH GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics). 2 posts vacant 1st May at Memorial Hospital, Woolwich, and at St. Nicholas Hospital, Plumstead. Recognised for F.F.A.R.C.S. and D.A. 6 months appointments and may then be renewed. Salary £670 p.a., less £150 p.a. for residence.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ABERYSTWYTH. GENERAL HOSPITAL. (Hospital recognised for F.R.C.S. examination.) MID-WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from newly qualified medical practitioners seeking pre-registration posts under the Medical Act, 1950, for the resident post of HOUSE SURGEON at the above Hospital. Busy General Hospital. Salary on national scale less deduction for board and lodging.

Applications, with 2 testimonials, to the Group Secretary, Mid-Wales Hospital Management Committee, General Hospital, Aberystwyth, immediately.

ABERYSTWYTH. GENERAL HOSPITAL. (Hospital is recognised for F.R.C.S. examination.) MID-WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the resident post of SENIOR HOUSE OFFICER at the above Hospital.

Full particulars, stating age, qualifications and experience, should be addressed to—

J. PRICE THOMAS, Secretary,
Mid-Wales Hospital Management Committee.
General Hospital, Aberystwyth.

ALTON, HAMPSHIRE. LORD MAYOR TRELOAR ORTHOPÆDIC HOSPITAL. LORD MAYOR TRELOAR GROUP HOSPITAL MANAGEMENT COMMITTEE. Locum SENIOR HOUSE OFFICER (either sex) required at the above Hospital for 3 months from end of March, 1954. Mainly for plastic work; orthopædic experience desirable but not essential. Resident or non-resident.

Apply as soon as possible to Secretary, Lord Mayor Treloar Group Hospital Management Committee, Treloar Hospital, Alton, Hants.

ASHFORD HOSPITAL, Ashford, Middlesex. Staines GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE SURGEON (Male) required at above Hospital for Traumatic and Orthopædic Unit. 6 months appointment, vacant 25th April, 1954. Preference given to pre-registration candidates.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital.

ASHFORD HOSPITAL, Ashford, Middlesex. Staines GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE OFFICER (Male) for Special Departments (E.N.T., pædiatric, ophthalmology, &c.). 6 months appointment, vacant on 27th April, 1954.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital.

AYLESBURY. ROYAL BUCKINGHAMSHIRE AND ASSOCIATED HOSPITALS MANAGEMENT COMMITTEE, AYLESBURY, BUCKS. Applications are invited for the following appointments:—

Stoke Mandeville Hospital

JUNIOR HOSPITAL MEDICAL OFFICER for National Spinal Injuries Centre. Neurological or surgical experience desirable.

Applications, with copies of 2 recent testimonials, to the Administrative Officer.

Tindal General Hospital

HOUSE SURGEON (Male or Female), pre-registration post, but registered practitioners invited to apply. The post offers wide experience of general surgery with operative practice, and is recognised for F.R.C.S. Vacant 1st April. The acute Surgical Unit consists of 95 Beds. No casualty department.

HOUSE SURGEON (E.N.T.), Male or Female, vacant now. New department with high turnover and 4 outpatient clinics weekly. Recognised for D.L.O. and F.R.C.S. No casualty department. Applications for a locum appointment also invited.

Please apply, with 2 testimonials, to the Administrative Officer as soon as possible.

St. John's Hospital (Psychiatric), Stone, near Aylesbury, Bucks

JUNIOR HOSPITAL MEDICAL OFFICER (resident or non-resident). Salary £700–£50–£1000 p.a., less a charge of £140 p.a. for board, lodging and laundry, if resident. Accommodation for married man available if required.

Applications, stating age, qualifications, and experience, together with the names of 3 referees, to the Physician-Superintendent within 2 weeks of the appearance of this advertisement.

BARNSLEY. BECKETT HOSPITAL. (182 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (anæsthetics). Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 22nd March, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

BEXHILL HOSPITAL, Bexhill, Sussex. (62 Beds.) 2 HOUSE SURGEONS. Posts now vacant. A small modern hospital on the South Coast, considerable acute surgical work and busy Outpatient Department, excellent all-round experience. National scale of salary.

Apply to Hospital Administrator.

BARNSTAPLE. NORTH DEVON INFIRMARY. (110 Beds.) HOUSE SURGEON (not pre-registration). Post vacant immediately.

Applications to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

BARROW-IN-FURNESS. NORTH LONSDALE HOS-PITAL. BARROW AND FURNESS HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for a post of SENIOR HOUSE PHYSICIAN at the North Lonsdale Hospital, Barrow-in-Furness. National conditions and salary scale.

Applications to Group Secretary, 52, Paradise-street, Barrow-in-Furness.

BEDFORD GENERAL HOSPITAL. (439 Beds.) RESIDENT HOUSE SURGEONS required towards end of March (2 pre-registration (1 vacant immediately) and 1 post-registration). The appointments offer exceptional opportunity for general experience in a busy acute Surgical Unit.

Applications, stating age, nationality, qualifications, previous appointments, appointment for which applying, together with copies of 2 testimonials, should be forwarded to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, as soon as possible.

BENENDEN SANATORIUM, Benenden, near Cranbrook, KENT. Applications are invited from registered medical practitioners (Male or Female) for the resident post of SENIOR HOUSE OFFICER, for which there will be a vacancy at the end of March, 1954. Appointment for 6 months or 1 year. Salary £650 p.a. with free board and lodgings. The Sanatorium of 154 Beds is for the treatment of adult male and female cases of pulmonary tuberculosis, and is independent of the National Health Service. Superannuation scheme in operation.

Applications, stating age, qualifications, previous experience, with copies of testimonials, should be sent as soon as possible to the Secretary.

BEXLEY HOSPITAL, Dartford Heath, Bexley, Kent. BEXLEY HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER at above Hospital. Salary £670 p.a., with deductions at £150 p.a. for board, lodging, &c., if resident. The Hospital (2300 Beds) deals with all types of psychiatric illness and experience in all modern physical, occupational and psychotherapeutic procedures is available. Opportunities will be available to assist at out-patient clinics.

Applications, with names and addresses of 3 referees, should be sent to the Physician-Superintendent, Dr. L. C. COOK, M.D., D.P.M., within 14 days of the appearance of this advertisement.

BIRMINGHAM ACCIDENT HOSPITAL AND REHABILI-TATION CENTRE, Bath-row, BIRMINGHAM, 15. (215 Beds.) HOUSE SURGEONS (Male or Female). Posts vacant immediately, March and April. Recognised for F.R.C.S. The appointments will be for a period of 6 months, of which 2 may be spent in the Burns Unit (Medical Research Council). The Hospital is the largest Traumatic Unit in the country, and treats 50,000 new patients each year. Posts are open to registered practitioners and offer ample opportunity for practical experience in the management of all types of injury and teaching by the Consultant staff.

Applications, with copies of recent testimonials or names of 2 referees, to the Administrator.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

1. Mid-Worcestershire Hospital Management Committee, Birmingham-road, Bromsgrove

Whole-time REGISTRAR in Obstetrics and Gynæcology. Duties in Mid-Worcestershire Group at All Saints' Hospital, Bromsgrove (423 Beds) (7 notional half-days weekly), and Dudley and Stourbridge Group (4 notional half-days).

2. Birmingham (Sanatoria) Group Hospital Management Committee, Yardley Green Hospital, Birmingham, 9

REGISTRAR in Tuberculosis at Romsley Hill Sanatorium, near Halesowen, Worcestershire (133 Beds, including Diabetic Unit). Duties also at Birmingham Chest Clinic. Accommodation available.

Application forms from Group Secretaries, to be returned before 29th March, 1954. Candidates may visit hospitals.

BIRMINGHAM, 13. SORRENTO MATERNITY HOS-PITAL. (112 Beds, including 24 premature baby cots.) OBSTETRIC HOUSE SURGEON. Appointment recognised for D.Obst.R.C.O.G. Hospital affiliated to Birmingham Medical School for training of students. Post vacant 1st May, 1954.

Applications to the Obstetrician, not later than 24th March, 1954.

BIRMINGHAM. THE UNITED BIRMINGHAM HOS-PITALS. Applications are invited for the post of RESIDENT REGISTRAR in Anæsthetics, vacant 1st April and tenable for 1 year in the first instance. Preference will be given to candidates who have passed Part I, D.A., or primary F.F.A.R.C.S.

Application forms may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Edgbaston, Birmingham, and should be returned to him as soon as possible.

BIRMINGHAM. THE UNITED BIRMINGHAM HOS-PITALS. GENERAL HOSPITAL. Applications are invited for the post of CASUALTY SURGICAL REGISTRAR (resident), Registrar grade, for duty in the Casualty and Traumatic Department, with opportunities for experience in general surgery. The post is recognised by the Royal College of Surgeons for the purpose of the F.R.C.S. examination and is tenable for 1 year in the first instance. Candidates must be registered medical practitioners and have held a resident appointment in an approved hospital. Preference will be given to those holding a higher qualification.

Forms of application may be obtained from, and should be returned not later than 27th March, 1954, to the Secretary, The United Birmingham Hospitals, Queen Elizabeth Hospital, Edgbaston, Birmingham, 15.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. Applications are invited for the post of NON-RESIDENT SENIOR HOUSE OFFICER for duty in the Casualty Department at the General Hospital, Birmingham. The post will be vacant on 1st April and is tenable for 1 year. Candidates must be registered medical practitioners, and have held a resident appointment.

Forms of application may be obtained from, and should be returned as soon as possible to the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Edgbaston, Birmingham, 15.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE CHILDREN'S HOSPITAL. Applications are invited for the post of RESIDENT SURGICAL OFFICER (Registrar) vacant on 1st April, 1954, for 1 year. Candidates should have held house appointments and had surgical experience. Preference will be given to applicants who hold a higher qualification. Deduction of £135 from salary for residential emoluments.

Forms of application may be obtained from the House Governor, The Children's Hospital, Ladywood-road, Birmingham, 16, and should be returned not later than 24th March, 1954.

G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. Applications are invited for the post of NON-RESIDENT MEDICAL REGISTRAR to commence duty as soon as possible. M.R.C.P. and/or D.C.H. preferred.

Application forms to be obtained from the House Governor and returned immediately.

G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER (clinical pathology), vacant on 1st June, 1954, for 1 year. Applicants should have held resident appointments in a children's hospital or a children's department of a general hospital. The successful applicant will be required to work in the Clinical Pathological Department.

Forms of application may be obtained from the House Governor, and should be returned not later than 31st March, 1954. G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer grade) for duties within the Teaching Group, and resident at the General Hospital or at the Queen Elizabeth Hospital. The post will be vacant on 1st April, 1954, and tenable for 1 year. The appointment is recognised for the purpose of taking the F.F.A.R.C.S. examination.

Application forms may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Edgbaston, Birmingham, 15, and should be returned to him as soon as possible.

BISHOP'S STORTFORD, HERTFORDSHIRE. HAYMEADS HOSPITAL. Applications invited from registered practitioners for post of HOUSE OFFICER (obstetrics), Male or Female (first, second or third post held), to commence 1st May, 1954, for period of 6 months. Duties in connection with Obstetric Department, Neonatal Nursery and Pædiatric Ward of 24 Beds. Salary £350–£450 p.a., less £100 in respect of resident facilities provided.

Applications, stating nationality, age, qualifications and experience, with copies of recent testimonials or names of referees, to Hospital Secretary as soon as possible.

BISHOP'S STORTFORD AND DISTRICT HOSPITAL, Rye-street, BISHOP'S STORTFORD, HERTS. (67 Beds—medical, surgical, and maternity. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited from registered medical practitioners for a RESIDENT HOUSE OFFICER (first or second post held). Salary £350–£400 p.a., less £100 p.a. residential emoluments. Appointment to commence as soon as possible.

Applications, stating age, nationality, qualifications, and experience, with copies of recent testimonials or the names of referees, should be sent to the Hospital Secretary, Haymeads Hospital, Bishop's Stortford, Herts.

BLACKBURN. ROYAL INFIRMARY. (262 acute beds.) HOUSE SURGEON required. Post recognised F.R.C.S. and approved for pre-registration purposes.

Apply to Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BLACKPOOL. VICTORIA HOSPITAL. (344 Beds.) RESIDENT HOUSE OFFICER (gynæcology and obstetrics). Recognised for M.R.C.O.G. Post vacant 26th April, 1954. This is a busy general hospital with a large Outpatient Department and the post offers excellent opportunities for experience under Consultant Gynæcologists and Obstetricians.

Applications, with references, to the Hospital Secretary.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (medical), Rossendale General Hospital. (Resident or non-resident.)

Applications, giving names of 2 referees, should be made to—
H. WILKINSON, Esq., Group Secretary.
Bury General Hospital, Bury, Lancs.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE.

Bury General Hospital

HOUSE OFFICER (surgical), pre-registration post.
SENIOR HOUSE OFFICER (surgical), resident or non-resident.
SENIOR HOUSE OFFICER (anæsthetics), resident or non-resident. Recognised for D.A.

Applications, stating experience, qualifications, &c., with names of 2 referees, should be made to—
H. WILKINSON, Esq., Group Secretary.
Bury General Hospital, Bury, Lancs.

BOLTON. THE ROYAL INFIRMARY. (237 Beds.) BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE.

RESIDENT SENIOR HOUSE OFFICER in Orthopædic Surgery. Tenable for 12 months and recognised for F.R.C.S.

SENIOR HOUSE OFFICER in Surgery (resident or non-resident) for duties in Casualty Department. Tenable for 12 months and recognised for F.R.C.S. Suitable appointment for practitioner requiring time for study for higher qualification. Basic duties 9 A.M.–5 P.M.

Applications, stating age, nationality, qualifications and experience and the names of 2 referees, should be sent immediately to H. P. TRAVIS, Group Secretary.

The Royal Infirmary, Bolton.

BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Orthopædic Surgery for the above Hospital Group consisting of 18 hospitals with 1548 beds. The orthopædic work is conducted mainly at the 2 major hospitals of the Group, viz., Royal Victoria Hospital, Bournemouth, and Poole General Hospital with 100 orthopædic beds and large Outpatient Departments covering both traumatic and non-traumatic orthopædics in all branches in children and adults.

Forms of application, obtainable from the Group Secretary, Hospital Management Committee Office, Royal Victoria Hospital, Gloucester-road, Bournemouth, should be returned to him, duly completed, within 14 days of the appearance of this advertisement.

BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. BOURNEMOUTH CHILDREN'S UNIT. Applications are invited for the post of PÆDIATRIC SENIOR HOUSE OFFICER to the above Unit, situated at the Christchurch Hospital. Duties include conduct of an Infant Welfare Centre. The post is recognised for the D.C.H. and will be vacant on 18th April.

Applications, with copies of testimonials, should be sent to the Group Secretary, Hospital Management Committee Office, Royal Victoria Hospital, Gloucester-road, Boscombe, Bournemouth, not later than 17th March, 1954.

BRIGHTON AND LEWES HOSPITAL MANAGEMENT COMMITTEE GROUP HOSPITALS. SENIOR HOUSE OFFICER for duties in the E.N.T. Department (78 Beds) of the Group Hospitals. Vacant end of March. Recognised for F.R.C.S. and D.L.O.

Applications, with details of experience, &c., together with the names and addresses of 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. FRENCHAY HOSPITAL. (519 staffed beds, expanding.) Applications are invited for the post of SENIOR HOUSE OFFICER in the regional Neurosurgery Department. This post offers useful surgical experience and the opportunity of gaining a working knowledge of neurological diagnosis.

Applications to the Secretary, Frenchay Hospital, quoting "N.S.F." Names of 2 referees required.

BRISTOL (near). WINFORD ORTHOPÆDIC HOSPITAL. (232 Beds.) SENIOR HOUSE OFFICER. Applications are invited from registered medical practitioners to fill a vacancy at end of March, 1954. Salary £670 p.a. Post tenable for 12 months or longer, resident or non-resident (Hospital bus service to and from Bristol).

Apply, stating age, qualifications and experience, with testimonials to undersigned as soon as possible.

E. N. ROPER, Secretary.

BROMLEY GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in Anæsthetics for duty at Group hospitals, residing at Bromley Hospital, required 1st April, 1954, for 6 months (may be renewed). Recognised for D.A. Salary £670, less £150 residence.

Apply, naming 3 referees, to Administrative Officer, Bromley Hospital, Bromley, Kent.

BRADFORD CHILDREN'S HOSPITAL. 2 House Officers (Female), 1 vacant now, 1 vacant 1st May. Recognised for D.C.H. Salary £350–£450 p.a., less £100 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience, with copy testimonials to Secretary, Bradford Royal Infirmary

BRADFORD. ST. LUKE'S HOSPITAL. Senior House OFFICER (general medicine and clinical pathology), vacant 1st May. Salary £670 p.a., less £130 p.a. residential emoluments.

Applications, stating age, nationality, qualifications, and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRADFORD. ST. LUKE'S HOSPITAL. House Officer (anæsthetics), vacant now. Recognised for D.A. and F.F.A. R.C.S. Opportunities for plastic and intrathoracic experience. Salary £350–£450 p.a., less £100 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRADFORD. ROYAL EYE AND EAR HOSPITAL. HOUSE SURGEON (ophthalmology), vacant 1st April. Recognised for D.O.M.S. and F.R.C.S. Salary £350–£450 p.a., less £100 p.a. residential emoluments.

Applications, stating age, nationality, qualifications, and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRADFORD ROYAL INFIRMARY.

SENIOR ORTHOPÆDIC HOUSE SURGEON/CASUALTY OFFICER, vacant now.

ORTHOPÆDIC HOUSE SURGEON/CASUALTY OFFICER (Junior), vacant now. Recognised for pre-registration training.

Appucations for either of above posts with copy testimonials to Secretary.

BRADFORD ROYAL INFIRMARY.
HOUSE SURGEON (general and urology), vacant now. Recognised for F.R.C.S. and pre-registration purposes.
HOUSE OFFICER (anæsthetics), vacant 28th April. Recognised for D.A. and F.F.A.R.C.S. Opportunities for plastic and intra-thoracic experience.
Salary for either of above posts £350–£450 p.a., less £100 p.a. residential emoluments.
Applications, stating age, experience, qualifications, and nationality, with copy testimonials, to Secretary.

CAERPHILLY HOSPITAL. (Married quarters. 144 Beds for general surgery, orthopædics, E.N.T., ophthalmology and gynæcology; 26 Beds for general medicine.) 2 SENIOR HOUSE OFFICERS and 1 HOUSE SURGEON (pre-registration if suitable candidate available) required. Hospital situated near Cardiff in pleasant surroundings.
Apply to Secretary, Hospital Management Committee, Caerphilly, near Cardiff.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (276 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (casualty) which becomes vacant early in April. Salary £670 p.a. Recognised for the F.R.C.S.
Applications to be sent to the Hospital Secretary at the above Hospital.

CARDIFF. ST. DAVID'S HOSPITAL. (656 Beds.) Cardiff HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER required on 9th April, 1954, in acute medical wards to work under direction of Consultants.
Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF. THE UNITED CARDIFF HOSPITALS. Applications are invited for the appointment of RESIDENT REGISTRAR in the Department of Radiotherapy at Whitchurch Hospital, Cardiff.
Application forms can be obtained from the Secretary, United Cardiff Hospitals, Cardiff Royal Infirmary.

CARDIFF. THE UNITED CARDIFF HOSPITALS. The Board of Governors invites applications for the appointment of SENIOR HOUSE OFFICER in the Ophthalmic Department.
Application forms can be obtained from the Secretary, United Cardiff Hospitals, Cardiff Royal Infirmary.

COLCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following posts :—
Black Notley Hospital, Braintree, Essex (544 Beds)
SENIOR HOUSE OFFICER to Pulmonary Tuberculosis Unit (198 Beds). Post tenable for 1 year.
HOUSE OFFICER (orthopædic surgery). First, second or third post, tenable for 6 months. Recognised for F.R.C.S. Salary as scale, plus £50.
HOUSE PHYSICIAN (medical and pædiatric wards). First, second, third or pre-registration post; tenable for 6 months. Salary as scale, plus £50 p.a.
Locum REGISTRAR in Orthopædics. Salary £16 a week, less £150 a year if resident.
Locum REGISTRAR in Surgery. Salary £16 a week, less £150 a year if resident.
Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, 14, Pope's-lane, Colchester, Essex.

COLCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following posts, tenable for 6 months or 1 year :—
Essex County Hospital, Colchester (189 Beds)
SENIOR HOUSE OFFICER (Casualty and Radiotherapy Departments). Recognised for F.R.C.S.
SENIOR HOUSE OFFICER (Casualty and E.N.T. Departments). Recognised for F.R.C.S.
Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, 14, Pope's-lane, Colchester, Essex.

COLCHESTER. ST. MARY'S HOSPITAL, 14, Pope's-lane. Applications invited for post of SENIOR HOUSE OFFICER (medical) for duties at St. Mary's Hospital Geriatric Unit and at Essex County Hospital (general medical). Post tenable for 6 months or 1 year, resident or non-resident.
Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

COLCHESTER. SEVERALLS HOSPITAL. Junior HOSPITAL MEDICAL OFFICER (resident or non-resident) required. Commencing salary £700 p.a., rising to £1000 p.a. Furnished accommodation available for a single officer. There will be scope for work in the use of modern psychiatric methods in the wards.
Applications, with names of 2 referees, should be forwarded to Medical Superintendent.

CHESTER-LE-STREET. GENERAL HOSPITAL. (207 Beds.) DURHAM HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON (general surgery) required for a period of 6 months (post recognised as pre-registration appointment). This post is vacant immediately.
Applications, with 2 testimonials, should be forwarded to Group Secretary, Dryburn Hospital, Durham.

CHESTERFIELD ROYAL HOSPITAL. (257 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time MEDICAL REGISTRAR required. Appointment for 1 year in first instance.
Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 22nd March, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

CHESTERFIELD HOSPITAL MANAGEMENT COMMITTEE. Whole-time NON-RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER required for Whittington Hall, Chesterfield (372 female mentally deficient patients), and Scarsdale Hospital, Chesterfield. Salary £700–£50–£1000 p.a.
Apply M. H. BOONE, Secretary, from whom further particulars may be obtained.

CHESTER. DEVA HOSPITAL (Mental), Liverpool-road. PSYCHIATRIC JUNIOR HOSPITAL MEDICAL OFFICER wanted. Salary £700–£50–£1000 p.a. Accommodation available for single person. All forms of modern treatment available, including Insulin Unit. There are psychiatric outpatient clinics at 3 general hospitals, occupational therapy units, and voluntary treatment wards. Facilities given to study for higher qualifications.
Apply Medical Superintendent.

CHELTENHAM GENERAL EYE AND CHILDREN'S HOSPITAL. CHILDREN'S DEPARTMENT. Applications are invited for the post of RESIDENT MEDICAL OFFICER (House Officer grade) for the Children's Department (50 Beds). The appointment which is recognised for candidates entering for the D.C.H. offers scope for wide experience in all Departments of Pædiatrics, surgical cases and attendance at Outpatient Departments at the General Hospital. Previous hospital experience in pædiatrics is desirable. The appointment will be for a period of 6 months in the first instance.
Applications, together with copies of 3 testimonials, should be addressed to S. T. DAVIS, Group Secretary.
General Hospital, Cheltenham.

COVENTRY GROUP 20 HOSPITAL MANAGEMENT COMMITTEE.
Coventry and Warwickshire Hospital (346 Beds)
SENIOR HOUSE OFFICER or HOUSE OFFICER (fracture and orthopædic) for casualty duties. Recognised for F.R.C.S. and pre-registration.
Coventry Hospitals
RESIDENT SENIOR HOUSE OFFICER in Anæsthetics, vacant now. Salary £670 p.a. Recognised for F.F.A.R.C.S. Excellent experience in all types of general anæsthetics. Duties at Coventry and Warwickshire Hospital and Gulson Hospital.
Rugby. Hospital of St. Cross (168 Beds)
HOUSE SURGEON for general and orthopædic duties required immediately. Post recognised for F.R.C.S. and approved for Pre-registration Service.
Applications to Group Secretary, Stoney Stanton-road, Coventry.

DAGENHAM HOSPITAL, Rainham-road South, Dagenham. There is a vacancy for the position of RESIDENT MEDICAL OFFICER (chest diseases), Junior Hospital Medical Officer status, at the above Hospital of 155 Beds, for pulmonary tuberculosis—all stages. Salary £700 (for an Officer appointed not less than 2 years after registration as a medical practitioner)–£50–£1000 p.a. Sound knowledge in general medicine and experience in modern treatment of tuberculosis essential. Further particulars available from the Physician-Superintendent.
Applications, stating age, qualifications and previous experience, together with recent testimonials, should be sent to the undersigned within 7 days of the appearance of this advertisement. H. F. HARRIS, Deputy Group Secretary,
Ilford and Barking Group Hospital Management Committee.
King George's Hospital, Ilford.

DARLINGTON MEMORIAL HOSPITAL. (210 Beds.) DARLINGTON DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON (resident), which post is recognised for the F.R.C.S. (Eng.). Salary in accordance with national scale.
Apply, giving age and references, to the undersigned forthwith. G. W. BECKWITH, Group Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. Senior HOUSE OFFICER (casualty) required 31st March, 1954. Recognised for F.R.C.S.
Applications, stating full details together with copies of 2 testimonials, to be sent to Secretary at the Infirmary.

DERBY. DERWENT HOSPITAL. (187 Beds.) Sheffield REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (chest and infectious diseases) required. A Consultant Thoracic Surgeon attends this Hospital each week. Appointment for 1 year in first instance.
Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 22nd March, 1954, giving age nationality, qualifications, present and previous appointments with dates, naming 3 referees.

DOUGLAS. NOBLE'S ISLE OF MAN HOSPITAL. (160 Beds.) Applications are invited for the post of RESIDENT ANÆSTHETIST at this busy Hospital, which has been approved for Pre-registration Service. The post, which becomes vacant at the end of March, 1954, offers varied experience in pleasant surroundings. 4 residents on the staff, salary at the rate of £350, £400, or £450 a year, according to experience. A deduction of £100 a year made in respect of residential emoluments. Duties may include acting in the medical wards or casualty. Appointment for 6 months in first instance.
Applications, stating full details, with copies of 2 recent testimonials, to the Secretary, Noble's Hospital, Douglas, Isle of Man.

DOUGLAS. NOBLE'S ISLE OF MAN HOSPITAL. (160 Beds.) Applications are invited for the post of HOUSE PHYSICIAN at this busy Hospital, which has been approved for Pre-registration Service. The post, which becomes vacant at 1st April, 1954, offers varied experience in pleasant surroundings. 4 residents on the staff. Salary £350, £400 or £450 a year, according to experience. A deduction of £100 a year made in respect of residential emoluments. The appointment is for 6 months in first instance.
Applications, stating full details, with copies of 2 recent testimonials, to the Secretary, Noble's Hospital, Douglas, Isle of Man.

DOVERCOURT. HARWICH AND DISTRICT HOSPITAL. (30 Beds.) Applications invited for post of SENIOR HOUSE OFFICER (Resident Surgical Officer). Post tenable for 1 year.
Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

DORCHESTER. DORSET COUNTY HOSPITAL. West DORSET GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SURGICAL REGISTRAR (Registrar grade) at above Hospital, now vacant. Salary according to experience, with a deduction at the rate of £160 p.a., if resident.

Application form, obtainable from Group Secretary, West Dorset Hospital Management Committee, Damers-road, Dorchester, Dorset.

DORKING GENERAL HOSPITAL, Horsham-road, DORKING. RESIDENT SENIOR HOUSE OFFICER (obstetrics and gynæcology) for 1-year appointment (renewable). Post recognised for D.Obst.R.C.O.G.

Apply Medical Superintendent.

DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL GROUP. BIRMINGHAM REGION. Applications invited from registered practitioners for following appointments :—

The Guest Hospital, Dudley (154 Beds)

SENIOR HOUSE OFFICER (resident), casualty. Post now vacant. Salary £670 p.a., less £150 p.a. in respect of residential emoluments.

SENIOR HOUSE OFFICER (resident), surgical. Post now vacant. Salary £670 p.a., less £150 p.a. in respect of residential emoluments.

Corbett Hospital, Stourbridge (106 Beds)

SENIOR HOUSE OFFICER (resident), casualty. Post now vacant. Salary £670 p.a., less £150 p.a. in respect of residential emoluments.

Wordsley Hospital, near Stourbridge (478 Beds)

SENIOR HOUSE OFFICER (resident), Anæsthetist. Post now vacant. Salary £670 p.a., less £150 p.a. in respect of residential emoluments. In addition to general surgery, experience is available in gynæcology and there is a major Orthopædic Unit. Regional Plastic Surgery Unit at this Hospital.

SENIOR HOUSE OFFICER (resident), surgical. Post now vacant. Salary £670 p.a., less £150 p.a. in respect of residential emoluments.

Prestwood Sanatorium (200 Beds)

SENIOR HOUSE OFFICER (resident). Post now vacant. Salary £670 p.a., less £150 p.a. for residential emoluments.

Applications, stating age, experience, with copies of 3 recent testimonials, to Group Secretary, The Guest Hospital, Dudley, Worcs.

EAST CUMBERLAND HOSPITAL MANAGEMENT COMMITTEE. Appointment of House Officers. Applications are invited for the following appointments :—

Cumberland Infirmary, Carlisle (340 Beds)

1 HOUSE OFFICER (" Specials "—E.N.T. and Eyes).

1 SENIOR HOUSE OFFICER (orthopædics).

Applications, with names of 2 referees, should be forwarded immediately to the Secretary, East Cumberland Hospital Management Committee, Cumberland Infirmary, Carlisle.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (715 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER (non-resident), required in the Casualty Department at above Hospital.

Apply, stating age, nationality, qualifications and experience, together with names and addresses of 2 referees, to Group Secretary, Edgware General Hospital by 20th March, 1954.

EDINBURGH. ROYAL HOSPITAL FOR SICK CHIL-DREN. Applications are invited from registered medical practitioners for appointment of HOUSE SURGEON (E.N.T. Department), for 6 months commencing 1st April, 1954. National Health Service scale.

Applications, stating age, qualifications and experience, and names of 2 referees, to be sent immediately to Medical Superintendent, Edinburgh Central Hospitals, 18, Rillbank-terrace, Edinburgh, 9.

EDINBURGH. ROYAL EDINBURGH HOSPITAL FOR MENTAL AND NERVOUS DISORDERS. HOUSE OFFICERS (Male or Female) are required at the above Hospital. Salary according to scale. Excellent opportunity for comprehensive training.

Applications to Physician-Superintendent, Morningside-place, Edinburgh.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER required in the Department of Anæsthesia, vacant 23rd March, 1954. Post recognised for the D.A. and F.F.A.R.C.S. 12 months appointment.

Applications, giving the names and addresses of 2 referees, to the Secretary of the Management Committee.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. EPSOM GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for Whole-time OBSTETRICAL AND GYNÆCOLOGICAL REGISTRAR (106 Beds) at above Hospital. Resident, post vacant 1st June, 1954. Recognised in obstetrics and gynæcology by the College for M.R.C.O.G. and D.Obst.R.C.O.G. purposes. Candidates are invited to visit Hospital by appointment with Consultant in charge of department.

Forms of application (send stamped addressed foolscap envelope) may be obtained from Group Secretary at above Hospital and should be completed and returned by 27th March, 1954.

FARNBOROUGH HOSPITAL, Farnborough, Kent. (800 Beds.) HOUSE SURGEON required, for 6 months from 12th April, 1954. Recognised for the F.R.C.S. Preference given to pre-registration candidates. Salary according to experience.

Apply, stating age, qualifications with dates, and experience, and naming 3 referees, to the Administrative Officer by 26th March, 1954.

FARNBOROUGH HOSPITAL, Farnborough, Kent. (800 Beds.) ORTHOPÆDIC SENIOR HOUSE OFFICER required immediately for 6 months. Deduction for residence £150.

Apply, stating age, qualifications with dates, experience, and naming 3 referees, to the Administrative Officer.

EXETER CITY HOSPITAL. (195 Beds.) Exeter and MID-DEVON HOSPITALS MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of RESIDENT SENIOR HOUSE OFFICER (surgical), now vacant. The appointed Officer will act as Resident Surgical Officer to a Surgical Unit of 27 Beds at the City Hospital and may also have duties in the wards and Outpatient Department of the Royal Devon and Exeter Hospital. Salary £670 p.a. Health Service terms and conditions. Married accommodation is available.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to the Hospital Secretary, City Hospital, Exeter, within 14 days of the appearance of this advertisement.

GLASGOW. HAWKHEAD (MENTAL) HOSPITAL, 510, Crookston-road, GLASGOW, S.W.3. Applications are invited for the posts of SENIOR HOUSE OFFICER and JUNIOR HOSPITAL MEDICAL OFFICER in Psychiatry (Male or Female), resident or non-resident. The posts offer wide experience and training in all aspects of psychiatry (inpatient and outpatient), and all modern methods of treatment are carried out. Recognised for D.P.M. (Eng.).

Applications, together with the names of 2 referees, should be forwarded as soon as possible to the Physician-Superintendent at the above address.

GLASGOW ROYAL INFIRMARY. Senior House Officer in Anæsthetics. Duties at above Infirmary.

Write, giving 3 names for reference, not later than 3rd April, 1954, to the Secretary, Board of Management for Glasgow Royal Infirmary and Associated Hospitals, 135, Buchanan-street, Glasgow, C.1.

GREAT YARMOUTH AND GORLESTON GENERAL HOSPITAL, DENE SIDE, GREAT YARMOUTH. 2 HOUSE SURGEONS (Male or Female) required. The Hospital is staffed by a Consultant General Surgeon and a Consultant E.N.T. Surgeon, and is regularly visited by Consultant staff from the Norfolk and Norwich Hospital. Both are pre-registration posts. Salary £350, £400, or £450 according to experience, less £100 for residence. Alternatively, as Senior House Officer posts, salary £670, less £150 for residence. Membership of a Medical Defence Society is a condition of appointment.

Applications, stating age, qualifications and experience, with names of 2 referees, to Hospital Secretary.

GREENOCK. RAVENSCRAIG (MENTAL AND GEN-ERAL) HOSPITAL. (427 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER (resident post). Mental and general experience to be gained. Hospital is recognised as a training centre for the D.P.M. examination. Post is now vacant.

Applications, in writing, to the Physician-Superintendent.

GRIFFITHSTOWN, MONMOUTHSHIRE. COUNTY HOSPITAL. 251 Beds. SENIOR HOUSE OFFICER in Obstetrics and Gynæcology required 1st April. Post recognised for D.Obst. R.C.O.G. Modern Maternity Unit of 32 Beds. Salary £670, less £130 board-residence.

Write, quoting 2 referees, to T. A. JONES, Group Secretary, 64, Cardiff-road, Newport.

GRIMSBY GENERAL HOSPITAL. (226 Beds.) Grimsby HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER for Orthopædic, Fracture and Accident Service. Previous surgical and orthopædic experience would be an advantage. Locum would be considered.

Applications should be sent immediately to the Hospital Secretary, Grimsby General Hospital.

GRIMSBY. SPRINGFIELD HOSPITAL. (210 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT REGISTRAR (chest and infectious diseases) required. Accommodation is available for a single man. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 22nd March, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (232 Beds.) RESIDENT SENIOR HOUSE OFFICER for Anæsthetics required. The starting-date has not been fixed, but will probably be mid-April. Operations in main theatres totalled 4367 in 1953 and there is a large Casualty Department.

Apply, with full details of experience and copies of 3 testimonials, to Hospital Secretary.

HARROGATE GENERAL HOSPITAL. Harrogate and RIPON HOSPITAL MANAGEMENT COMMITTEE. Immediate vacancies are available for HOUSE OFFICERS (surgical) at the above Hospital. Applications from fully registered practitioners will be considered for a period of appointment of 3 or 9 months duration. Pre-registration practitioners will be considered for a 6 or 12 months appointment.

Applications to the Hospital Secretary.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) HOUSE SURGEON required. Resident. Male or Female. Post not pre-registration, vacant now. National scale of salary.

Apply to Hospital Administrator.

HOUNSLOW GENERAL HOSPITAL. (81 Beds.) Applications are invited for the appointment of CASUALTY OFFICER (resident). Senior House Officer grade, post now vacant. Salary £670 p.a., less £140 for residence, &c.

Applications, stating age, qualifications, experience, with copies of 3 recent testimonials or names for reference, to Hospital Secretary, Hounslow Hospital, Staines-road, Hounslow, Middlesex.

HALIFAX. ROYAL HALIFAX INFIRMARY. (301 Beds.) HOUSE SURGEON required. Post vacant 26th March. Approved pre-registration appointment.

Applications to Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. ROYAL HALIFAX INFIRMARY. (301 Beds.) SENIOR HOUSE OFFICER in Orthopædic Surgery required. Duties include work in the Casualty Department. Post recognised for F.R.C.S. Salary £670 p.a., with deduction of £130 p.a. for residence, &c.

Applications to Group Secretary, Royal Halifax Infirmary, Halifax.

HAROLD WOOD HOSPITAL, Harold Wood, Essex (near London). (421 Beds.) SENIOR HOUSE OFFICER (anæsthetics) resident. Main general and casualty hospital in Group. Recognised for D.A. Salary £670 p.a., less £130 p.a. board and lodging.

Apply, giving full details, to the Hospital Secretary (Tel.: Ingrebourne 2881).

INVERNESS HOSPITALS BOARD OF MANAGEMENT. ROYAL NORTHERN INFIRMARY. HOUSE SURGEON (E.N.T. and Eyes) required for 6 months from 1st April, 1954. Post recognised for pre-registration.

Applications, with references, to Medical Superintendent.

INVERNESS HOSPITALS BOARD OF MANAGEMENT. ROYAL NORTHERN INFIRMARY. HOUSE SURGEON (general surgery) required from 20th April, 1954. Post recognised for pre-registration.

Applications, with references, to Medical Superintendent.

IPSWICH. BOROUGH GENERAL HOSPITAL, Heath-road, IPSWICH. (275 Beds.) HOUSE SURGEON (pre-registration post). Applications are invited for the post of House Surgeon to General Surgeon, vacant on 11th April, 1954. The post, which is recognised for the R.C.S. examinations, is normally of 6 months duration, and is of House Officer grade.

Applications, stating age, experience and qualification, together with copies of recent testimonials, to Hospital Secretary.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) EAST ANGLIAN REGIONAL HOSPITAL BOARD. RADIOLOGICAL REGISTRAR. The department is the centre for consultant radiological services for the Ipswich Hospital Group. Appointment for 1 year, renewable for second year.

Detailed applications, including age and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 29th March, 1954. Candidates invited to visit Hospital by direct arrangement with Hospital Management Committee Secretary at the Hospital.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) Applications are invited for the post of HOUSE SURGEON to the Fracture and Orthopædic Department. Approved pre-registration post.

Applications, with copies of recent testimonials, to the Hospital Secretary.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. South WEST MIDDLESEX HOSPITAL MANAGEMENT COMMITTEE. Pre-registration HOUSE OFFICER required for Orthopædic Unit. Post recognised for F.R.C.S. Resident full-time.

Applications, stating age, nationality, qualifications obtained with copies of up to 2 recent testimonials, to Group Secretary, West Middlesex Hospital, Isleworth, Middlesex, by 23rd March, 1954.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. South WEST MIDDLESEX HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER required for Tuberculosis Unit of 90 Beds in a large general hospital, first, second, or third post.

Applications, stating age, nationality, qualifications and experience, with copies of up to 3 recent testimonials, to Group Secretary, West Middlesex Hospital, Isleworth, Middlesex, by 23rd March, 1954.

KENDAL. WESTMORLAND COUNTY HOSPITAL. (82 Beds.) RESIDENT SENIOR HOUSE OFFICER (surgical). The successful applicant will work with a Consultant Surgical Unit and attend at Consultative Clinics. The post is vacant March and normally tenable for 1 year.

Applications, with names of 2 referees, to be addressed to the Secretary, Royal Lancaster Infirmary, Lancaster.

KING'S LYNN. WEST NORFOLK AND KING'S LYNN GENERAL HOSPITAL. (140 Beds.) KING'S LYNN AREA HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (casualty). Appointment for 1 year. Salary £670 p.a., less £150 p.a. in respect of residential emoluments. Post offers excellent experience in casualty and orthopædic work.

Applications, with names and addresses of 2 referees, to be forwarded as soon as possible to Group Secretary of above Committee, St. James' Hospital, King's Lynn.

LEEDS (near). SCALEBOR PARK HOSPITAL, Burley-IN-WHARFEDALE, near LEEDS. Applications are invited for the post of SENIOR HOUSE OFFICER (Male or Female) at Scalebor Park, a modern hospital of 323 Beds for the active treatment of nervous and mental disorders. The Hospital is associated for teaching purposes with the Department of Psychiatry of Leeds University and facilities will be granted for attending the D.P.M. Course. The salary is £670 p.a., less £130 for full residential emoluments, or a house will be available for a married man, if required, for which an agreed rental will be payable.

Applications to the Medical Superintendent immediately.

LEEDS, 2. PUBLIC DISPENSARY AND HOSPITAL. LEEDS A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of CASUALTY OFFICER (Senior House Officer) at the above Dispensary. The appointment will be for a period of 1 year. Salary in accordance with the agreed terms and conditions of service of hospital medical and dental staffs, with an appropriate deduction in respect of board, lodging, &c.

Applications, stating age, qualifications, experience, &c., together with the names of 2 referees, to be forwarded to the undersigned as soon as possible.

J. FOLKARD, Secretary to the Committee.

Administrative Offices, St. James's Hospital, Leeds, 9.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the following REGISTRAR posts :—

Anæsthetics

Hull A Group with additional duties at hospitals in the Hull B and East Riding Groups (non-resident).

Infectious Diseases

Duties at the Leeds Road Hospital, Bradford (120 I.D. beds) (resident).

Orthopædic Surgery

Duties at the Woodlands Orthopædic Hospital, Rawdon (100 Beds), and Orthopædic Outpatient Department, Bradford Royal Infirmary. Offers excellent training in all branches of accident and orthopædic surgery. May be non-resident.

Psychiatry

*(a) Oulton Hall Hospital, near Wakefield, and affiliated Mental Deficiency Colonies (aggregating 780 Beds) (non-resident).

*(b) Storthes Hall Hospital, Kirkburton, near Huddersfield (2680 Beds), and associated clinics. Accommodation available for a single person.

*(c) Research Registrar at Menston Hospital, near Leeds. The successful applicant will undertake work in connection with a Research project already commenced in conjunction with the University Department of Biochemistry and Psychiatry. This work will occupy approximately half of the Registrar's time at present and candidates will be invited to submit proposals for the remainder. Previous experience of psychiatry is essential.

*Facilities for attendance at the Leeds University will be provided if the successful candidates are studying for the D.P.M.

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, should be forwarded to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 26th March, 1954.

LEEDS. UNITED LEEDS HOSPITALS. Applications are invited for the post of REGISTRAR in Anæsthetics which will become vacant shortly. The appointment will be for 1 year in the first instance.

Applications, giving full details of previous experience, together with the names of 3 referees, should be forwarded to the Sub-Dean, School of Medicine, Leeds, 1, not later than 26th March, 1954.

LEEDS. UNITED LEEDS HOSPITALS. Applications are invited for the post of RESIDENT NEUROSURGICAL OFFICER at the General Infirmary at Leeds. The post, which is vacant at the present time, will be of Registrar or Senior House Officer status according to experience. The appointment will be for 1 year in the first instance.

Applications, giving details of qualifications and previous posts held, together with the names of 3 referees, are to be addressed not later than 25th March, 1954, to the Secretary to the Board, General Infirmary, Leeds, 1.

LEEDS. UNITED LEEDS HOSPITALS. Applications are invited for the following senior resident posts which will be vacant at the General Infirmary at Leeds from 1st May next. All 4 appointments are of Senior House Officer status and will be for a period of up to 1 year in each case.

RESIDENT ANÆSTHETIC OFFICER.
RESIDENT ORTHOPÆDIC OFFICER.
RESIDENT RADIO-SURGICAL OFFICER.
RESIDENT UROLOGICAL OFFICER.

Applications, giving full details of qualifications and previous posts held, together with the names of 3 referees, are to be addressed to the Secretary to the Board, General Infirmary, Leeds, 1, not later than 25th March, 1954.

LEEDS. UNITED LEEDS HOSPITALS. Applications are invited for 3 posts of SENIOR HOUSE OFFICER status which will be vacant on 1st May, 1954, in the Receiving-room of the General Infirmary at Leeds. The appointments will be for 6 months in the first instance. Residence in the Hospital is optional.

Applications, stating qualifications and previous posts held, together with the names of 3 referees, to be sent not later than 25th March, 1954, to the Secretary to the Board, General Infirmary, Leeds, 1.

LEEDS (near). WOODLANDS (ORTHOPÆDIC) HOSPITAL, RAWDON, near LEEDS. (92 Beds.) SENIOR HOUSE SURGEON required for Orthopædic Hospital, at Rawdon. The post will be adjoined to the Casualty and Orthopædic Unit at the Royal Infirmary, Bradford, and offers excellent opportunities for a person interested in orthopædic work. Salary £670 p.a., less £130 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

LIVERPOOL. WALTON HOSPITAL. (1321 Beds.)
SENIOR HOUSE OFFICER (orthopædic surgery), vacant 1st April, 1954.
SENIOR HOUSE OFFICER (neurosurgery), vacant immediately.

Vacancies exist in the above 2 posts, providing wide experience.

Applications, stating age, date of qualification, and experience, with copies of 2 recent testimonials, to Physician-superintendent.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for the following House Officer posts for the period to 31st August, 1954:—

David Lewis Northern Hospital
ORTHOPÆDIC HOUSE SURGEON.
Royal Southern Hospital
CASUALTY OFFICER.
Royal Liverpool Children's Hospital
HOUSE SURGEON (City Branch).
HOUSE SURGEON (Heswall Branch).
ORTHOPÆDIC HOUSE SURGEON (City Branch).

All the posts are open to pre-registration and other applicants.

Apply immediately on forms obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for a locum tenens appointment as SENIOR REGISTRAR in Pathology at the David Lewis Northern Hospital for a period of approximately 12 weeks commencing on 29th March, 1954, or as soon as possible thereafter.

Apply as soon as possible on forms obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for a post of RESIDENT ANÆSTHETIC REGISTRAR for the period to 30th September, 1954, with duties mainly at the Liverpool Maternity Hospital. The successful candidate will be eligible to apply for reappointment from 1st October, 1954, and if reappointed will be allocated duties in a general hospital.

Apply not later than 25th March, 1954, on forms obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LIVERPOOL, 20. BOOTLE HOSPITAL. Junior Hospital MEDICAL OFFICER required as Casualty Officer. Post vacant now.

Applications to F. J. WATKINS, Secretary, giving names of 2 referees.

LINCOLN. COUNTY HOSPITAL. (200 Beds.) Applications are invited for an approved Registration post in Surgery at the above Hospital.

Apply with full particulars to—

R. W. HOWICK, Group Secretary.

LEAMINGTON SPA. WARNEFORD GENERAL HOSPITAL. (207 Beds.) SOUTH WARWICKSHIRE HOSPITAL GROUP. Applications are invited (Male or Female) for the appointment of CASUALTY OFFICER (Senior House Officer), resident or non-resident. The post is vacant on 4th April, 1954, and is suitable for one reading for higher qualifications, offering facilities for contact with all Specialist Units in the Hospital.

Applications, with the names and addresses of 3 referees, to be sent to the Hospital Secretary.

LEAMINGTON SPA. WARNEFORD GENERAL HOSPITAL. (207 Beds.) SOUTH WARWICKSHIRE HOSPITAL GROUP. Applications are invited for HOUSE SURGEON (E.N.T. and Ophthalmology).

Applications as soon as possible to Hospital Secretary.

LEAMINGTON SPA. WARNEFORD GENERAL HOSPITAL. (207 Beds.) SOUTH WARWICKSHIRE HOSPITAL GROUP. Applications are invited for HOUSE OFFICER (anæsthetics). The post is recognised for D.A.

Applications as soon as possible to the Hospital Secretary.

LLANELLY HOSPITAL. (166 Beds.) Glantawe Hospital MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the 2 posts of JUNIOR HOSPITAL MEDICAL OFFICER (resident) for work in the Surgical Unit of 75 Beds. The posts offer excellent experience in general surgery.

Applications, stating age, experience and qualifications, to be addressed to the Hospital Secretary, Llanelly Hospital, Marble Hall-road, Llanelly.

LLANELLY HOSPITAL, Llanelly, Carmarthenshire. GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the resident appointment of JUNIOR HOSPITAL MEDICAL OFFICER in the E.N.T. Department of the above Hospital. Salary £700–£50–£1000.

Applications, with full details of experience, qualifications and age, together with the names of 2 referees, should be sent to the Hospital Secretary, Llanelly Hospital, Llanelly, Carms.

LUTON AND DUNSTABLE HOSPITAL, Luton, Beds. Applications are invited for the post of HOUSE PHYSICIAN. Recognised as pre-registration post. Vacant 5th April, 1954. The appointment will be for 6 months in the first instance.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Secretary by 30th March, 1954.

MAIDENHEAD HOSPITAL, St. Luke's-road, Maidenhead. Applications invited from registered practitioners for post of CASUALTY OFFICER, now vacant. Post recognised for F.R.C.S. Salary on House Officer scale plus £50 p.a.

Applications, stating age, qualifications, and experience, with copies of testimonials, to Hospital Secretary.

MAIDSTONE. MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT ANÆSTHETIST for joint duties at the Kent County Ophthalmic and Aural Hospital, and the West Kent General Hospital, Maidstone (total beds 248). The post, which is vacant now, is of Senior House Officer grade, and carries a salary of £670 a year, less £150 for residential emoluments. Excellent experience under Consultant Anæsthetists is available, and the post is recognised for the F.F.A.R.C.S. examination.

Applications, stating age, nationality, qualifications and experience, together with the names of 2 suitable referees, should be forwarded to the Administrative Officer, Kent County Ophthalmic and Aural Hospital, Maidstone.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (135 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RECEIVING-ROOM OFFICER. Post vacant immediately. Salary £670 a year, with deduction of £150 a year for residential emoluments.

Applications to Administrative Officer at Hospital as soon as possible.

MARKET DRAYTON (near), SHROPSHIRE. CHESHIRE JOINT SANATORIUM. (305 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. RESIDENT MEDICAL OFFICER required (Junior Hospital Medical Officer or Senior House Officer according to experience). The post offers exceptional experience in the treatment of pulmonary tuberculosis.

Applications to the Medical Superintendent at the Sanatorium.

MARGATE. GENERAL HOSPITAL. (132 Beds.) Senior HOUSE OFFICER (surgical). Recognised for F.R.C.S. and D.A. Salary £670 p.a., less charge for residential emoluments.

Applications, with copies of testimonials, to Hospital Secretary.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications invited for the resident post of REGISTRAR in Obstetrics/Gynæcology with duties mainly at Queen's Park Hospital, Blackburn, a general hospital of 644 Beds of which 83 are allocated to this specialty under the control of 2 Consultant Obstetricians/Gynæcologists. Post recognised for F.R.C.O.G.

Application forms from the Secretary, Hospital Management Committee, Royal Infirmary, Blackburn.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications invited for the resident post of REGISTRAR in General Surgery at the Royal Infirmary, Blackburn, an acute general hospital of 262 Beds of which over 100 are allocated to general surgery under the control of 3 Consultant surgeons. Posts recognised for F.R.C.S.

Application forms from the Secretary, Hospital Management Committee, Royal Infirmary, Blackburn.

MANCHESTER REGIONAL HOSPITAL BOARD. REGISTRAR in Anæsthetics to the Bolton and District Group of hospitals, with main duties at Bolton Royal Infirmary and Bolton District General Hospital. Recognised for the D.A. and F.F.A. R.C.S.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees, should be sent immediately to the undersigned at the Royal Infirmary, Bolton.

H. P. TRAVIS, Group Secretary,
Bolton and District Hospital Management Committee.

MANCHESTER REGIONAL HOSPITAL BOARD. Royal MANCHESTER CHILDREN'S HOSPITAL. SALFORD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SURGICAL REGISTRAR (Resident Surgical Officer) falling vacant 1st June, 1954. Previous experience in surgery essential. Experience in pædiatric surgery and the Diploma of F.R.C.S. desirable. The Hospital is the chief teaching unit of the University Department of Child Health.

Applications, stating age, nationality and experience, together with names of 3 referees, to be forwarded to the Group Secretary, Salford Royal Hospital, Chapel-street, Salford, 3, to be received not later than Monday, 5th April, 1954.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR in Psychiatry at Whittingham Hospital, near Preston, Lancs. Salary £775–£890. Modern house available for married man. If resident a charge of £160 p.a. will be made for board, residence and laundry. Comfortable living accommodation.

Applications, endorsed "Medical Officer," giving details of experience and the names of 3 referees, to be addressed to the Chairman and received as soon as possible.

MANCHESTER REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR (resident) post now vacant, Birch Hill Hospital, Rochdale. Recognised for D.A. examination and tenable for 1 year in first instance.

Apply at once to the Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, Lancs.

MANCHESTER REGIONAL HOSPITAL BOARD. BIRCH HILL HOSPITAL. OBSTETRIC AND GYNÆCOLOGICAL REGISTRAR (resident) post now vacant. Post recognised for 6 months of D.Obst.R.C.O.G. examination. Tenable for 1 year in the first instance.

Apply at once to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of ORTHOPÆDIC REGISTRAR in the Ashton, Hyde and Glossop Group of hospitals, with duties mainly at Ashton-under-Lyne General Hospital. There are 50 orthopædic beds and busy Orthopædic and Casualty Outpatient Departments.

Application forms obtainable from, and returnable to, the Group Secretary, Ashton, Hyde and Glossop Hospital Management Committee, Astley-road, Stalybridge, Cheshire.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE.

Park Hospital, Davyhulme (General Hospital—426 Beds)

1 SENIOR HOUSE OFFICER (anæsthetics). Hospital recognised for training for Diploma in Anæsthetics. Post now vacant.

1 SENIOR HOUSE OFFICER (pædiatrics). Hospital recognised for training for Diploma in Child Health. Vacant 1st May, 1954.

2 HOUSE OFFICERS (general surgery) (pre- or post-registration). Posts recognised for F.R.C.S. examination. Posts now vacant.

1 HOUSE OFFICER (E.N.T.) (pre- or post-registration). Post now vacant.

Eccles and Patricroft Hospital (General Hospital—72 Beds)

1 SENIOR HOUSE OFFICER, vacant mid-April, 1954.

1 HOUSE OFFICER (post-registration post). Additional allowance of £50 p.a. Post now vacant.

The work of the Hospital is mainly surgical and there is a busy Outpatient Department.

Forms from Secretary, Park Hospital, Davyhulme.

MANCHESTER UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. REGISTRAR to the Department of Anæsthetics, to commence as soon as possible. Whole-time, non-resident post, tenable for 12 months, renewable. Applicants should preferably possess a higher qualification.

Applications to be made on forms obtainable from the undersigned and to be returned not later than 27th March, 1954.

G. H. TAYLOR, Secretary.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. SENIOR HOUSE OFFICER to the Department of Hæmatology, to commence as soon as possible. Whole-time, non-resident post. Appointment for 6 months, renewable for a second and possibly a third 6 months. Salary £670 p.a.

Applications, to be made on forms obtainable from the undersigned and to be returned not later than 27th March, 1954. G. H. TAYLOR, Secretary.

MANCHESTER, 19. THE DUCHESS OF YORK HOSPITAL FOR BABIES. MANCHESTER BABIES' AND CHILDREN'S HOSPITAL MANAGEMENT COMMITTEE. Required, HOUSE PHYSICIAN (Male or Female) for 6 months. The Hospital is associated with Manchester University for teaching purposes.

Applications, with copies of 3 testimonials, to be sent to the Administrative Officer of the Hospital as soon as possible.

MANCHESTER (near). ALTRINCHAM GENERAL HOSPITAL AND ANNEXE. (130 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (surgical) to commence as soon as possible. This appointment, in a busy general hospital staffed by Manchester Consultants, affords excellent experience to suitably qualified candidates. Opportunity will be given to assist in the major surgical work of the Hospital. Post recognised under F.R.C.S. regulations. Applications will also be considered for the post of JUNIOR HOUSE OFFICER (surgical).

Full particulars should be forwarded to the Group Secretary, North and Mid-Cheshire Hospital Management Committee, The Hospital, Sinderland-road, Altrincham, Cheshire.

MANCHESTER (near). ALTRINCHAM GENERAL HOSPITAL AND ANNEXE. (130 Beds. Recognised under F.R.C.S. regulations.) MANCHESTER REGIONAL HOSPITAL BOARD. NORTH AND MID-CHESHIRE GROUP OF HOSPITALS. Applications are invited for the post of RESIDENT SURGICAL REGISTRAR, to commence duties as soon as possible. This appointment, in a busy general hospital staffed by Manchester Consultants, offers excellent opportunity of practical surgical experience to suitably qualified candidates.

Applications, together with 2 recent testimonials, to be sent to Group Secretary, North and Mid-Cheshire Hospital Management Committee, Sinderland-road, Altrincham, Cheshire, as soon as possible.

MORECAMBE. QUEEN VICTORIA HOSPITAL. (100 Beds.) RESIDENT SENIOR HOUSE OFFICER (obstetrics and gynæcology). The post is vacant March and tenable for 1 year. Successful applicant will work with the Specialist Unit, but will be expected to relieve the Senior House Officer (Surgical), during absence.

Applications, with full particulars, to Secretary, Royal Lancaster Infirmary, Lancaster.

NEWMARKET GENERAL HOSPITAL, Newmarket, SUFFOLK. Applications are invited for the post of SENIOR HOUSE OFFICER (obstetrics (14 Beds), gynæcology (10 Beds)), with opportunity for gaining experience in general surgery. Post vacant on 22nd April, 1954. Salary £670 p.a., less emoluments.

Applications, giving age, nationality, and qualifications, together with copies of 3 recent testimonials, to be addressed to the Physician-Superintendent.

NEWPORT, MONMOUTHSHIRE. ROYAL GWENT HOSPITAL. (260 Beds.) SENIOR HOUSE OFFICER in General Surgery required. The post is based here, but covers work at another hospital also. House Surgeons are engaged at both and the post is of a senior character, providing good experience. Salary £670.

Write, quoting 2 referees, to T. A. JONES.
64, Cardiff-road, Newport, Mon.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the non-resident post of REGISTRAR in the Children's Department to begin on 1st April, 1954. The appointment will be to the children's department but in the first instance the successful candidate will be required to work in the Babies' Hospital and will be given the opportunity to gain experience in the children's wards of the Royal Victoria Infirmary later.

Applications, giving full details with the names and addresses of 3 referees, should be sent to the undersigned within 7 days of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.
Royal Victoria Infirmary, Newcastle upon Tyne.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the resident appointment of SENIOR HOUSE OFFICER in the Children's Department of the Royal Victoria Infirmary. The department is responsible for the care of patients in the children's wards and outpatient clinic of the Royal Victoria Infirmary and in the Babies' Hospital and for the care of infants in the Princess Mary Maternity Hospital. The appointment, which is for 1 year, will be subject to Ministry of Health terms and conditions of service. The successful candidate will work at the Princess Mary Maternity Hospital.

Applications, giving full details with the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.
Royal Victoria Infirmary, Newcastle upon Tyne.

NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER or SENIOR HOUSE SURGEON (orthopædics). Joint appointment now vacant at Newcastle General Hospital (861 Beds) and the W. J. Sanderson Orthopædic Hospital School for Children (121 Beds). Duties mainly at the latter hospital where resident accommodation is available.

Applications, with copies of 2 recent testimonials, should be sent to the Group Secretary, Newcastle upon Tyne Hospital Management Committee, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, 4.

NEWCASTLE REGIONAL HOSPITAL BOARD. BIENCATHRA SANATORIUM, near KESWICK. (100 Beds.) REGISTRAR CHEST PHYSICIAN (whole-time) resident. Salary £775–£890. Appointment will be for 1 year in the first instance, with probable extension for a further period. A house is available.

Applications, together with names and addresses of referees (preferably), or testimonials, to a total of 3, to be sent to the Senior Administrative Medical Officer, 1, Lonsdale-street, Carlisle, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. St. LUKE'S HOSPITAL, MIDDLESBROUGH. (540 Beds.) REGISTRAR PSYCHIATRIST (whole-time), resident. Furnished flat available. Appointment for 1 year in the first instance, and may be renewed for a further period. Salary £775–£890 p.a. Previous experience in psychiatry desirable, but not essential. A large amount of outpatient work (including children) is carried out from this Hospital. There is also an active Electro-encephalographic Department. Arrangements can be made for the person appointed to take the necessary course of study for the Durham Diploma in Psychological Medicine. Further particulars regarding the appointment may be obtained from the Physician-Superintendent.

Applications, together with names and addresses of referees (preferably), or testimonials, to a total of 3, to be sent to the Regional Psychiatrist, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 7 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. St. GEORGE'S HOSPITAL, MORPETH. REGISTRAR PSYCHIATRIST (whole-time), resident (single accommodation only available). Salary £775–£890 p.a. Appointment for 1 year in the first instance and may be renewed for a further period. Arrangements can be made for the person appointed to take the necessary course of study for the University of Durham Diploma in Psychological Medicine.

Applications, together with names and addresses of referees (preferably), or testimonials, to a total of 3, to be sent to the Regional Psychiatrist, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 7 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. St. GEORGE'S HOSPITAL, MORPETH. (1170 Beds.) SENIOR PSYCHIATRIC REGISTRAR (resident), whole-time. Salary scale £1000–£1300. Candidates should normally have had previous experience in psychiatry, but applications will be considered from candidates with no previous practical experience in psychiatry who hold a higher medical qualification, have had wide experience in general medicine and intend to obtain a Diploma in Psychological Medicine and specialise in psychiatry. Arrangements can be made for the person appointed to take the necessary course of study for the Durham Diploma in Psychological Medicine. A small 3-roomed, furnished or unfurnished, flat in Hospital is available. The appointment is for 1 year in the first instance, and may be renewed from year to year for 4 years. Candidates are free to visit the Hospital by arrangement with the Medical Superintendent, from whom further particulars may be obtained.

Applications, together with names and addresses of referees (preferably), or testimonials, to a total of 3, to be sent to the Regional Psychiatrist, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 7 days.

NORTHAMPTON GENERAL HOSPITAL. (485 Beds.) Vacancies 1st April, 1954, for the following :—

4 HOUSE OFFICERS (general surgery).

FRACTURE AND ORTHOPÆDIC HOUSE OFFICER.

HOUSE OFFICER (Casualty Department) to work in conjunction with Senior House Officer—casualty.

All recognised for F.R.C.S. and for pre-registration.

SENIOR HOUSE OFFICER (Casualty Department) to work in conjunction with another Senior House Officer—casualty. Recognised for F.R.C.S.

SENIOR HOUSE OFFICER (E.N.T. Department). Recognised for F.R.C.S. and for D.L.O.

All 6-month appointments in first instance. Deduction £100 a year for residential emoluments.

Applications, enclosing copies of 3 testimonials, as soon as possible to S. G. HILL, Superintendent.

NOTTINGHAM AND MIDLAND EYE INFIRMARY. Required, SENIOR HOUSE OFFICER for the above Hospital. Duties to commence on or about 23rd April, 1954. Salary £670 p.a., less a deduction of £150 for residential emoluments. Salary and conditions of service in accordance with Ministry regulations.

Applications, stating age, qualifications and experience, together with testimonials, to be sent to—

HENRY M. STANLEY, Group Secretary.
General Hospital, Nottingham.

NOTTINGHAM. CITY HOSPITAL. (134 Beds. Recognised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SURGICAL REGISTRAR required. Post becomes vacant 1st June, 1954. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 22nd March, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

NOTTINGHAM GENERAL HOSPITAL. Hogarth Radiotherapy centre. A vacancy exists at the above Centre for a SENIOR HOUSE OFFICER in Radiotherapy or REGISTRAR (if in possession of part I D.M.R.T.) in Radiotherapy. The Centre is recognised as a Training School for both Part I and II D.M.R.(T.) (Royal College of London) in conjunction with the University of Nottingham, and instruction for this examination can be given to those interested and suitable. The position offers excellent experience for persons studying for other postgraduate degrees.

Apply as soon as possible, stating age, qualifications and experience, together with names of 3 referees, to the Group Secretary, General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR ORTHOPÆDIC AND FRACTURE HOUSE OFFICER. The post offers exceptional experience in traumatic and orthopædic surgery. Duties to commence as soon as possible. Salary and conditions of service in accordance with Ministry regulations. If resident £150 deducted for emoluments.

Applications, stating age, qualifications, and experience, together with copies of testimonials, to be sent to—

HENRY M. STANLEY, Group Secretary.

NOTTINGHAM. HIGHBURY HOSPITAL. Senior HOUSE OFFICER required (non-resident). The successful candidate will, in addition to medical duties, have an opportunity of assisting in the Obstetric Unit. Terms and conditions of service as laid down by the Ministry of Health. This post will be accepted as a general medical appointment for entry to the M.R.C.O.G. examination.

Apply in writing, stating age, qualifications and experience, together with copies of testimonials, to the undersigned as soon as possible. HENRY M. STANLEY, Secretary.

NOTTINGHAM HOSPITAL FOR WOMEN, AND CHILDREN'S HOSPITAL, NOTTINGHAM. SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT REGISTRAR (anæsthetics) required. This appointment is interchangeable with one at the Nottingham City Hospital where the post is recognised for the D.A. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 22nd March, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

NORWICH. NORFOLK AND NORWICH HOSPITAL. (440 Beds.) Applications are invited for the appointment of SENIOR HOUSE OFFICER ANÆSTHETIST. Salary £670 p.a. If residential accommodation required, deduction £150 p.a.

Applications, stating age, qualifications, experience, with names for reference, to Secretary (Group 6), Hospital Management Committee, St. Stephen's-road, Norwich.

OSWESTRY. THE ROBERT JONES AND AGNES HUNT ORTHOPÆDIC HOSPITAL. SENIOR SURGICAL HOUSE OFFICER (resident) required 1st April, 1954. Appointment in the first place for 6 months with a possibility of extension.

Applications, with copies of 2 recent testimonials, to be sent to the Secretary to reach him not later than 20th March.

OXFORD. UNITED OXFORD HOSPITALS. Applications invited for the post of SENIOR HOUSE PHYSICIAN (non-resident) to the Nuffield Department of Medicine at the Radcliffe Infirmary, Oxford, with effect from 1st May, 1954, for 6 months.

Applications, stating age, qualifications and experience, together with names of 2 referees, to Administrator, Radcliffe Infirmary, Oxford, by 29th March, 1954.

PAISLEY. DYKEBAR MENTAL HOSPITAL. (461 Beds.) SENIOR HOUSE OFFICER or JUNIOR HOSPITAL MEDICAL OFFICER. Post resident.

Applications, in writing, to the Physician-Superintendent.

PERTH. COUNTY AND CITY OF PERTH GENERAL HOSPITALS. Applications are invited for the following posts which are now vacant :—

HOUSE SURGEON (General Surgical Unit), Perth Royal Infirmary.

HOUSE SURGEONS (3), for the Fracture and Orthopædic Unit, Bridge of Earn Hospital.

These posts are recognised for Pre-registration Hospital Service and by the Royal College of Surgeons under regulations for the F.R.C.S.

Applications should be sent to the Medical Superintendent, Perth Royal Infirmary, Perth.

PETERBOROUGH. THE MEMORIAL HOSPITAL. PETERBOROUGH AND STAMFORD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the position of SENIOR HOUSE OFFICER (orthopædic), vacant now. Salary £670 p.a. Exceptional experience offered in busy department.

Apply to the Secretary, Memorial Hospital, Peterborough.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL. Applications are invited from registered medical practitioners for the appointments of :—

(1) HOUSE SURGEON in Obstetrics and Gynæcology, 14th May, 1954, recognised for the Membership of the Royal College of Obstetricians and Gynæcologists. Wide experience can be obtained in obstetrics, including antenatal and postnatal clinics.

(2) SENIOR HOUSE OFFICER in Surgery, Freedom Fields, March, 1954. The Hospital is recognised for the Fellowship of the Royal College of Surgeons.

(3) HOUSE SURGEONS, Greenbank Road, immediately and 20th April, 1954, recognised for the Fellowship of the Royal College of Surgeons.

(4) HOUSE SURGEON, Devonport, 18th May, 1954.

Applications, stating age, nationality, qualifications and experience, with names of 3 referees, to be sent to—

ARTHUR R. CASH, Group Secretary.

7, Nelson-gardens, Stoke, Plymouth.

PONTEFRACT GENERAL INFIRMARY. Resident CASUALTY OFFICER required. Graded Senior House Officer. Salary £670. Recognised for Fellowship.

Applications to the Secretary, Pontefract and Castleford Hospital Management Committee, Gt. Northern House, Salter-row, Pontefract, Yorks.

PONTEFRACT. GENERAL INFIRMARY. Pontefract AND CASTLEFORD HOSPITAL MANAGEMENT COMMITTEE (YORKS). RESIDENT SURGICAL OFFICER required. Graded Senior House Officer. Salary £670. 1-year appointment. Recognised for Fellowship. Offers good scope for practical experience. Vacant. Married accommodation available if required.

Applications to Secretary, Gt. Northern House, Salter-row, Pontefract, Yorks.

PONTYPOOL AND DISTRICT HOSPITAL, Pontypool, MONMOUTHSHIRE. (115 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER (surgical) required immediately. This is the senior resident post, and resident staff consists of 2 House Surgeons, a House Physician and this post. This is a busy acute general hospital with a good Outpatient Department and regular visits from Consultants. Post offers good practical experience in surgery. Salary £700–£50–£1000, less £150 board-residence.

Write, quoting names of 2 referees, to—

T. A. JONES, Group Secretary.

64, Cardiff-road, Newport, Mon.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. MATERNITY AND GYNÆCOLOGICAL DEPARTMENT OF THE PORTSMOUTH GROUP OF HOSPITALS. HOUSE SURGEON required. Main duties at Queen Alexandra Hospital (39 gynæcological beds). Post recognised for the purpose of D.Obst.R.C.O.G. and M.R.C.O.G.

Applications, stating age, experience and qualifications, together with the names of 2 referees, should be submitted as soon as possible to E. H. HURST.

35, Grove-road South, Southsea.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the following post vacant on 29th March, 1954, ANÆSTHETIC SENIOR REGISTRAR in the Portsmouth Group, 5 Consultant Anæsthetists practise in the Group. This post offers experience in most branches of anæsthesia.

Forms of application may be obtained from the Secretary, Portsmouth Group Hospital Management Committee, 35, Grove-road South, Southsea, which should be returned to him duly completed on or before 26th March, 1954. Canvassing will disqualify. Candidates may visit the above Hospitals by arrangement with the Secretary of the Group.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following appointments :—

Saint Mary's Hospital

SENIOR HOUSE PHYSICIAN, vacant now. The duties will be mainly in medical wards that form an Admission Unit for 450 geriatric beds in the Group, a Consultant Physician being in charge of this Unit. In addition, the successful candidate will act as Registrar to 20 acute medical beds in the Hospital.

Royal Portsmouth Hospital

SENIOR HOUSE SURGEON (Orthopædic and Casualty Departments), vacant now.

Queen Alexandra Hospital

(124 surgical beds) Recognised for F.R.C.S.

SENIOR HOUSE SURGEON, vacant now.

HOUSE SURGEONS, 2 posts vacant now. Pre-registration posts.

Infectious Diseases Hospital (310 Beds—Fever and T.B.)

SENIOR HOUSE OFFICER, vacant now.

Applications, stating age, experience, and qualifications, and names of 2 referees, should be submitted as soon as possible to—

35, Grove-road South, Southsea. E. H. HURST.

PORTSLADE. FOREDOWN HOSPITAL. (60 Beds —Infectious Diseases.) JUNIOR HOSPITAL MEDICAL OFFICER (non-resident), post vacant early April, 1954, will include duties at other hospitals in the Group.

Applications, stating age, qualifications, nationality, previous posts held, together with the names of 2 referees, should be sent to the Administrative Officer, c/o Hove General Hospital, Sackville-road, Hove, 3, not later than 20th March, 1954.

READING. ROYAL BERKSHIRE HOSPITAL. (403 Beds.) Applications are invited from registered medical practitioners for the appointment of RESIDENT ASSISTANT PATHOLOGIST, vacant 1st April, 1954. The appointment is for 6 months and previous experience in pathology is not necessary. £350–£450 p.a., according to experience, less £100 board-residence.

Apply, stating age, qualifications with dates, nationality, and present post with copy of 1 recent testimonial, to Secretary.

ROCHFORD, ESSEX. GENERAL HOSPITAL. Applications are invited from medical practitioners of either sex for the appointment of RESIDENT HOUSE OFFICER to the Obstetric and Gynæcological Department. The Hospital has 70 maternity beds, a gynæcological ward of 25 beds, and a Premature Baby Unit of 8 cots. Post vacant 1st April, 1954, and is recognised for the D.Obst.R.C.O.G.

Applications, &c., to be sent to the undersigned by 20th March, 1954. J. C. FIELD, Secretary.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER (resident) required for duties in the Casualties and Admission Department. This is a large general hospital with specialised departments dealing with all types of acute medical and surgical cases. The post affords good opportunity for gaining tuition and experience.

Applications should be addressed to Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, as soon as possible.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER in Pathology required in this large general hospital containing well-equipped laboratory where excellent opportunities exist for gaining extensive experience.

Applications to be sent to Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

REDHILL COUNTY HOSPITAL. Earlswood Common, REDHILL, SURREY. RESIDENT HOUSE SURGEON (pre-registration), vacant 24th March.

Applications to Group Secretary at above address.

REDHILL. EAST SURREY HOSPITAL, Shrewsbury-road, REDHILL, SURREY. RESIDENT HOUSE SURGEON (pre-registration), vacant 19th April.

Applications to Hospital Secretary at above address.

ROCHDALE AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. BIRCH HILL HOSPITAL (GENERAL). RESIDENT ANÆSTHETIC SENIOR HOUSE OFFICER. Post now vacant. Recognised for D.A. examination.

Apply at once to the Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, Lancs.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of RESIDENT SURGICAL OFFICER (Registrar) at above Hospital.

Further details and application forms obtainable from and should be returned to Group Secretary, Odstock Hospital, Salisbury, within 14 days of the appearance of this advertisement.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER to the E.N.T. Department. The Department is recognised for D.L.O. and F.R.C.S. Post vacant 20th March.

Applications, naming 2 referees, to Group Secretary, Odstock Hospital, Salisbury, Wilts.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER (Gynæcological and Obstetric Unit) which becomes vacant mid-April, 1954. The Unit comprises 40 obstetric beds and 35 gynæcological beds and is recognised for the Diploma and Membership of the Royal College. Preference will be given to candidates with previous experience in these subjects.

Apply immediately, stating age, nationality, qualifications, and experience, with 2 recent testimonials, to the Group Secretary, Odstock Hospital, Salisbury.

SALISBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (tuberculosis). Salary £700–£50–£1000. The person appointed will gain experience of all forms of tuberculosis and chest clinic work. The main duties will consist of day-to-day care of 48 beds for male patients at Odstock Hospital.

Applications, together with details of experience and names of 2 referees, to Group Secretary, Odstock Hospital, Salisbury, Wilts.

SCARBOROUGH HOSPITAL. (190 Beds.) Required, SENIOR HOUSE OFFICER (surgical) to commence duty towards the end of April. Terms and conditions of service in accordance with those prescribed for medical and dental staffs. The post will be for a period of 6 months (it is recognised by the Royal College of Surgeons for the F.R.C.S. for that period) or for any longer period which may be mutually agreed. The position is non-resident but there is a flat available near to the Hospital, if required.

Applications, giving age, qualifications, details of present and previous appointments, and the names of 2 referees, should be forwarded to the Hospital Secretary.

SHREWSBURY. ROYAL SALOP INFIRMARY. (241 Beds.) SHREWSBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of ORTHOPÆDIC/ACCIDENT HOUSE SURGEON (Senior House Officer). The successful applicant will be allowed to attend for 2 days a month at The Robert Jones and Agnes Hunt Orthopædic Hospital, Oswestry, for postgraduate study with the Consultant. Post recognised under revised Fellowship regulations in respect of 6 months training required for the Final Fellowship examination. Vacant 1st April, 1954.

Applications, stating age, qualifications, nationality and experience, accompanied by copy testimonials, should be sent to the Group Secretary, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY AND COPTHORNE HOSPITAL. (500 Beds.) SHREWSBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer). Post recognised under conditions of F.F.A.R.C.S. examination. Vacant immediately.

Applications, stating age, nationality, qualifications and previous experience, together with copies of recent testimonials, should be sent to the Group Secretary, Royal Salop Infirmary, Shrewsbury.

SHEFFIELD NO. 1 HOSPITAL MANAGEMENT COMMITTEE. Locum SENIOR HOUSE OFFICER (general medicine) required for duties at the City General Hospital and Fir Vale Infirmary for the period 1st April–14th July, 1954. Remuneration at the rate of £13 per week with a deduction for residence.

Apply, naming 2 referees, to the undersigned at Nether Edge Hospital, Sheffield, 11. W. STANSFIELD, Secretary.

SHEFFIELD REGIONAL HOSPITAL BOARD. 2 Locum REGISTRARS (anæsthetics) required immediately at the following Hospitals: (*a*) Beckett Hospital, Barnsley, (*b*) Moorgate General Hospital, Rotherham. Remuneration at the rate of £16 per week with a deduction if resident.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Locum SENIOR REGISTRAR (anæsthetics) required immediately at the City General Hospital, Sheffield, for a minimum period of 1 month. Remuneration at the rate of £22 per week with a deduction if resident.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Locum SENIOR SURGICAL REGISTRAR required from 16th April at the General Hospital, Nottingham, for a period of 1 month in first instance. Remuneration at the rate of £22 per week with a deduction if resident.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time Resident Locum SURGICAL REGISTRAR required immediately at the Montagu Hospital, Mexborough. Remuneration at the rate of £16 per week with a deduction for residence.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. ROYAL INFIRMARY UNIT. Applications are invited for the post of NON-RESIDENT REGISTRAR in E.N.T. Surgery at the above Hospital. Post vacant.

Applications, stating age, qualifications and experience, with the names of 3 referees, should be sent immediately to the Chief Administrative Officer, The United Sheffield Hospitals, Weststreet, Sheffield, 1.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications are invited for the following posts which will fall vacant on 1st May, 1954 :—

(*a*) RESIDENT SENIOR HOUSE OFFICER in Anæsthetics, Royal Infirmary Unit.

(*b*) NON-RESIDENT REGISTRAR or SENIOR HOUSE OFFICER in Clinical Pathology. Grade according to qualifications and experience.

Applications for both posts should state age, qualifications and experience, the names of 3 referees, and be sent immediately to : for post (*a*) The Superintendent, Royal Infirmary, Sheffield, 6 ; for post (*b*) The Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1. Copy testimonials may be sent for post (*a*).

SHEFFIELD. CITY GENERAL HOSPITAL. (642 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT CASUALTY REGISTRAR required. The successful candidate to reside at the Hospital when on duty (including " on call " duty). Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 22nd March, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR in Psychiatry at Craig Dunain Hospital, Inverness.

Forms of application and further particulars are obtainable from the undersigned, with whom applications should be lodged by 22nd March, 1954. A. M. FRASER, M.D.,

Secretary and Administrative Medical Officer.

Office of the Northern Regional Hospital Board.

Raigmore, Inverness.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR in Radio-diagnosis in the Edinburgh Northern Group of hospitals. The post is superannuable and the conditions of service are in accordance with the regulations.

Applications, giving particulars of age, qualifications and experience, together with the names of 2 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, within 30 days.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of Whole-time RADIOLOGICAL (DIAGNOSTIC) REGISTRAR at the above Hospital. Previous experience essential. The appointment entails duties at other hospitals in the Group. Candidates may visit the Hospital if they so desire.

Forms of application, obtainable from the undersigned, should be returned not later than 27th March, 1954.

FRANK JENNINGS, Secretary,

Southampton Group Hospital Management Committee.

Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) CASUALTY OFFICER SENIOR HOUSE OFFICER (orthopædic) required for the above Hospital (Orthopædic Unit 74 Beds). This Hospital is the centre to which all trauma from a large industrial town and port is directed, thus providing excellent experience in the treatment of traumatic conditions.

Applications, with copies of testimonials, to be submitted as soon as possible, to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHEND GENERAL HOSPITAL. Applications are invited for the post of SECOND CASUALTY OFFICER (House Officer grade) with duties in the Fracture and Orthopædic Department. Post vacant 16th April.

Applications, stating age, qualifications, and experience, with copies of 3 recent testimonials, to reach the undersigned by 18th March, 1954. J. C. FIELD, Secretary.

SOUTHPORT AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE.

Southport General Infirmary

SENIOR HOUSE OFFICER/SURGEON with casualty duties.

Southport Promenade Hospital

SENIOR HOUSE OFFICER/SURGEON. Duties include mainly orthopædic and E.N.T. work.

Above resident posts are tenable for 12 months and will be vacant in April. Salary £670 p.a., less £130 for board, &c.

Apply with 2 testimonials to—

T. CROOK, Group Secretary,

Southport and District Hospital Management Committee.

Promenade Hospital, Southport.

STOKE-ON-TRENT. BUCKNALL ISOLATION HOSPITAL. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for the post of SENIOR HOUSE OFFICER (medical) vacant shortly.

Applications, with copy testimonials and full details, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. (938 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the posts of SENIOR HOUSE OFFICER (surgical). 2 posts are available if no applicants are forthcoming for pre-registration appointments. The posts are recognised for F.R.C.S. examination.

Applications, giving details of previous appointments held together with copies of recent testimonials, should be forwarded forthwith to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. (938 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the posts of HOUSE OFFICER (general surgery) pre-registration. 3 posts. Vacant shortly.

Applications, with copy testimonials, to be forwarded to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE OFFICER (gynæcology and obstetrics, mainly surgery). Recognised for M.R.C.O.G. (gynæcology).

Applications, giving full details, together with copy testimonials, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (475 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for post of SENIOR HOUSE OFFICER (ophthalmics). Recognised for F.R.C.S. and D.O.

Applications, stating age, and experience, together with copy testimonials, to the Group Secretary at Head Office, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOCKTON-ON-TEES. THE CHILDREN'S HOSPITAL, Durham-road. (74 Beds.) CLEVELAND HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE OFFICER or alternatively SENIOR HOUSE OFFICER according to experience of candidate. The appropriate salary and conditions of service being in accordance with the Ministry of Health regulations.

Applications, with copies of 2 recent testimonials, should be forwarded to the undersigned at West Lane Hospital, Middlesbrough, as early as possible.

L. BRITTAIN, Group Secretary.

ST. ALBANS (near), HERTFORDSHIRE. SHENLEY HOSPITAL. (2232 Beds. 16 miles from London.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR HOUSE OFFICER (psychiatric), resident or non-resident, for 1 year in the first instance, at above Hospital. Opportunity for work with neurotic as well as psychotic patients, and full facilities for D.P.M. training. The Hospital may be visited by appointment.

Applications to the Medical Superintendent.

SWANSEA HOSPITAL. (403 Beds.) Glantawe Hospital MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the resident appointment of SENIOR HOUSE OFFICER in the Gynæcological Department of the above Hospital.

Applications, stating age, qualifications and experience, should be addressed to the Group Secretary, Glantawe Hospital Management Committee, St. Helen's-road, Swansea.

SWANSEA. MOUNT PLEASANT HOSPITAL. Glantawe HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in Obstetrics for the new Maternity Unit of 44 Beds which will be opened shortly at the above Hospital.

Applications, stating age, qualifications and experience, should be addressed to the Group Secretary, Glantawe Hospital Management Committee, St. Helen's-road, Swansea.

SWANSEA. MOUNT PLEASANT HOSPITAL. Glantawe HOSPITAL MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the resident appointment of JUNIOR HOSPITAL MEDICAL OFFICER for work in the Medical and Surgical Departments, and in the Chronic Sick Wards of the above Hospital.

Applications, stating age, experience, and qualifications, should be addressed to the Group Secretary, Glantawe Hospital Management Committee, St. Helen's-road, Swansea.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE SURGEON to the Unit of Obstetrics and Gynæcology required. Post recognised for M.R.C.O.G. Preference given to candidates who have had previous experience in midwifery and gynæcology, and who are seeking a pre-registration House Officer post. Salary on national scale.

Applications, stating age, experience, and qualifications with dates, together with copies of 2 testimonials, should be forwarded to the Hospital Secretary by 26th March.

TYNEMOUTH VICTORIA JUBILEE INFIRMARY, Hawkey's-lane, NORTH SHIELDS, NORTHUMBERLAND. (109 Beds.) Applications are invited for the following posts available now :—

SENIOR HOUSE SURGEON.
HOUSE SURGEON.

House Surgeon post is recognised for Pre-registration Service, and, subject to certain conditions, for F.R.C.S. purposes.

Applications with 2 testimonials or names of 2 referees, should be sent to the Group Secretary, Preston Hospital, North Shields.

TUNSTALL. BURSLEM, HAYWOOD AND TUNSTALL WAR MEMORIAL HOSPITAL. (96 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for SENIOR HOUSE OFFICER (surgical).

Apply, with copy testimonials and details of previous appointments held, to the Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, as soon as possible.

TALGARTH, BRECONSHIRE. SOUTH WALES SANATORIUM. Applications are invited for the post of RESIDENT ASSISTANT MEDICAL OFFICER (Junior Hospital Medical Officer status). This Sanatorium consists of 284 Beds for male adult pulmonary cases. Accommodation is available for a married man.

Applications, with names of 3 referees, to Physician-Superintendent.

VENTNOR, ISLE OF WIGHT. ROYAL NATIONAL HOSPITAL FOR DISEASES OF THE CHEST. (249 Beds.) Required :—

JUNIOR HOSPITAL MEDICAL OFFICER, and
SENIOR HOUSE OFFICER.

Resident posts, unmarried. Hospital has all facilities for major thoracic surgery.

Applications, with names of 2 referees, to Physician-Superintendent.

WAKEFIELD A GROUP HOSPITAL MANAGEMENT COMMITTEE NO. 9. Applications are invited for the appointment of a RESIDENT or NON-RESIDENT ANÆSTHETIST (Junior Hospital Medical Officer grade) for work in all branches of surgery in the Wakefield A and Wakefield B Groups, including thoracic anæsthesia at the Leeds Regional Thoracic Centre at Pinderfields Hospital, Wakefield. This post is recognised for the D.A. qualification. The salary and conditions of service being in accordance with the National Health Service regulations.

Applications should be made to W. READ, Group Secretary. Clayton Hospital, Wakefield.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. THORACIC UNIT. Applications invited for the following appointment in the Leeds Regional Thoracic Centre (54 Beds) at Pinderfields General Hospital :—

SENIOR HOUSE SURGEON, salary £670 p.a., less a charge of £130 p.a. for board, lodging, &c., or
Locum SENIOR HOUSE SURGEON, salary £13 per week, less a charge of £2 10s. a week for board, lodging, &c.

Address written applications, with full particulars and 2 names and addresses for reference, to—

W. E. EASTWOOD, Deputy Group Secretary,
Hospital Management Committee No. 10 Wakefield B Group.
Victoria Chambers, Wood-street, Wakefield.

WATFORD. SHRODELLS HOSPITAL. Applications are invited for the post of HOUSE OFFICER (Senior House Officer grade) to the Pædiatric Unit of 38 Beds. Post recognised for the D.C.H.

Applications, together with 2 copies of recent testimonials, should reach the Medical Officer-in-charge, as soon as possible.

WEST BROMWICH AND DISTRICT GENERAL HOSPITAL. Edward-street, WEST BROMWICH. (144 Beds.) WEST BROMWICH AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE, GROUP NO. 18. Applications are invited for the posts of :—

HOUSE PHYSICIAN, vacant on 1st April, 1954.
HOUSE SURGEON, vacant on 1st May, 1954.

Salary, terms and conditions in accordance with the Ministry of Health regulations. The posts are tenable for 6 months, resident, and are recognised for pre-registration scheme.

Applications, together with 3 recent testimonials, should be submitted to J. O. ROBINS, Esq., Group Secretary.

WESTON-SUPER-MARE GENERAL HOSPITAL. (110 Beds.) Applications are invited from registered medical practitioners for the resident appointment of HOUSE SURGEON (non pre-registration). The appointment will be for a period of 6 months in the first instance and may be renewed for a further 6 months.

Applications, stating age, qualifications and experience, together with names and addresses of 2 referees, should be addressed to the Secretary, Weston-super-Mare Hospital Management Committee.

WOLVERHAMPTON HOSPITAL MANAGEMENT COMMITTEE GROUP NO. 16 BIRMINGHAM REGION.

The Royal Hospital, Wolverhampton (an Associated Hospital of the University of Birmingham Medical School)
SENIOR HOUSE OFFICER or HOUSE OFFICER (Fracture and Orthopædic Department), vacant now.
HOUSE OFFICER (Ear, Throat and Nose Department), vacant now.

New Cross Hospital, Wolverhampton
HOUSE OFFICER (general surgery), vacant now.

Applications, with copies of 3 recent testimonials, to be sent to W. COCKBURN, Group Secretary.
The Royal Hospital, Wolverhampton.

WOLVERHAMPTON. ROYAL HOSPITAL. Applications invited for RESIDENT SURGICAL REGISTRAR to this Hospital (310 Beds). Appointment starts 1st April for 1 year in first instance. Applicants should be F.R.C.S.

Apply, naming 3 referees, to Group Secretary, Royal Hospital, Wolverhampton, by 20th March, 1954.

WOLVERHAMPTON. THE ROYAL HOSPITAL. Wolverhampton GROUP NO. 16 HOSPITAL MANAGEMENT COMMITTEE. Applications for the post of REGISTRAR in Department of Diagnostic Radiology, which falls vacant on 14th April, are invited. Candidates, who should possess at least Part I of a Diploma of Medical Radiology, will be expected to undertake work in the other hospitals of the Group.

Applications, stating age, qualifications, and experience, &c., should be addressed to the Group Secretary, The Royal Hospital, Wolverhampton, not later than 25th March, together with the names of 3 referees. The Hospitals may be visited by arrangement.

WORCESTER ROYAL INFIRMARY. (243 Beds.) Applications are invited for the appointment of SENIOR HOUSE OFFICER in Surgery which is now vacant. The appointment, which is recognised for the F.R.C.S examinations, is the senior of the resident surgical posts and offers wide experience in surgery. A charge of £130 p.a. will be made for residential emoluments.

Applications to the Secretary, from whom further particulars may be obtained.

WORCESTER ROYAL INFIRMARY. House Surgeon (orthopædics) required immediately.

Applications to the Secretary, from whom further particulars may be obtained.

WORCESTER ROYAL INFIRMARY. Casualty Officer (non-resident) required for vacancy at beginning of May, 1954. The post is of Senior House Officer status and is recognised for the F.R.C.S. examinations.

Applications to Secretary, from whom further particulars can be obtained.

WELSH REGIONAL HOSPITAL BOARD.

REGISTRAR (general surgery), Neath General Hospital (resident or non-resident).

REGISTRAR (psychiatry), Morgannwg Hospital, Bridgend. Hospital provides all modern methods of treatment, active outpatient clinics, Child Guidance and Psychological Departments. Accommodation available.

Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WILLERBY (near Hull), E. YORKSHIRE. DE LA POLE HOSPITAL. (1174 Beds. Mental illness and nervous disorders.) Locum Tenens ASSISTANT MEDICAL OFFICER (Junior Hospital Medical Officer grade) for above Hospital. £16 per week. Residence for married or single person.

Application forms from Group Secretary, above address.

WREXHAM. MAELOR GENERAL HOSPITAL. (513 Beds.) WREXHAM, POWYS AND MAWDDACH HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON at the above Hospital to commence immediately. The appointment is recognised for the Diploma of F.R.C.S. (Eng. and Edin.). Salary will be at the rate of £350, £400, or £450 p.a., according to experience, less £100 p.a. for full residential emoluments.

Applications, stating age, nationality, qualifications and experience, together with copies of 2 recent testimonials, should be addressed to—

WILLIAM JONES, Secretary, Wrexham,
Powys and Mawddach Hospital Management Committee.
Maelor General Hospital, Croesnewydd-road, Wrexham.

WREXHAM. WAR MEMORIAL HOSPITAL. (170 Beds.) WREXHAM, POWYS AND MAWDDACH HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (resident or non-resident) for the Casualty Orthopædic Department of the above Hospital. The appointment is recognised for the Diploma of F.R.C.S. (Eng. and Edin.). Salary £700–£50–£1000 p.a., Whitley Council conditions of service.

Applications, giving details of age, qualifications, and previous experience, together with copies of 2 recent testimonials, should be sent to—

WILLIAM JONES, Secretary, Wrexham,
Powys and Mawddach Hospital Management Committee.
Maelor General Hospital, Wrexham.

WREXHAM. WAR MEMORIAL HOSPITAL. (170 Beds.) WREXHAM, POWYS AND MAWDDACH HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON at the above Hospital, to commence immediately. The appointment is recognised for the Diploma F.R.C.S. (Eng. and Edin.), and is an approved pre-registration House Officer post. Salary will be at the rate of £350, £400, or £450 p.a., according to experience, less £100 p.a. for residential emoluments.

Applications, stating age, nationality, qualifications, and experience, together with copies of 2 recent testimonials, should be addressed to—

WILLIAM JONES, Secretary, Wrexham,
Powys and Mawddach Hospital Management Committee.
Maelor General Hospital, Croesnewydd-road, Wrexham.

YORK A AND TADCASTER HOSPITAL MANAGE-MENT COMMITTEE.

County Hospital, York (Acute Hospital of 269 Beds with full Consultant staff)

CASUALTY OFFICER (with charge of orthopædic beds), resident or non-resident (Junior Hospital Medical Officer grade) as from 25th March. Salary £700–£50–£1000, less £153 if resident. Recognised for F.R.C.S.

County Hospital, York, City Hospital, York, Yearsley Bridge Hospital (Infectious Diseases Hospital of 86 Beds)

Required as soon as possible SENIOR HOUSE OFFICER in Pædiatrics and Infectious Diseases to spend approximately half-time in connection with pædiatric duties at the County Hospital (22 pædiatric beds), City Hospital (32 pædiatric beds) and other Hospitals in the Group, and approximately half-time at Yearsley Bridge Hospital. Candidates should have had previous experience of pædiatrics and infectious diseases. Preference given to holders of D.C.H. Salary £670 p.a., less £170 for residence at Yearsley Bridge Hospital.

Applications, giving age, nationality, experience, qualifications, and names of 2 referees, to the Secretary, York A and Tadcaster Hospital Management Committee, Bootham Park, York.

YORKSHIRE. EAST RIDING HOSPITAL MANAGE-MENT COMMITTEE.

Westwood Hospital, Beverley, Yorks (218 Beds)

(*a*) ORTHOPÆDIC HOUSE SURGEON (Senior House Officer), vacant now. Recognised for F.R.C.S.

(*b*) HOUSE SURGEON (first, second, or third post), vacant now. Pre-registration post. Recognised for F.R.C.S. General surgical duties, some orthopædics.

Broadgate (Mental) Hospital, Beverley, Yorks (650 Beds)

(*c*) HOUSE PHYSICIAN (first, second, or third post), vacant now.

Salary for (*a*) is £670 p.a., less £140 board, lodging; for (*b*) and (*c*) £350–£450, less £100 board, lodging. Fully qualified practitioners also invited to apply for pre-registration post.

Detailed applications to Secretary, Westwood Hospital, Beverley, Yorks.

NEW YORK. ALBANY HOSPITAL, Albany, New York, U.S.A. PSYCHIATRY RESIDENCIES available in 700-Bed University-teaching, General Hospital with 60-Bed acute treatment Psychiatric Unit fully approved for 3 years training. Experience includes dynamically oriented psychotherapy with children and adults, shock therapies and neurologic training. Salary range $1620–$2220 annually, plus laundry, uniforms, and room.

Address inquiries to Medical Director.

NEW YORK. NEW ROCHELLE HOSPITAL, New ROCHELLE, NEW YORK, U.S.A. (360-Bed general community hospital.) Approved by American College of Surgeons and American Medical Association for Internship and Residency Training. Only graduates from approved university schools accepted. Term of Internship: 1st July, 1954–30th June, 1955. INTERNES—$100 per month plus full maintenance. Return passage to England paid by Hospital after completion of interneship.

Apply Superintendent.

Public Appointments

BIRMINGHAM. CITY OF BIRMINGHAM. Public HEALTH DEPARTMENT. Applications are invited for the appointment of Full-time or Part-time ASSISTANT DENTAL OFFICERS in the Maternity and Child Welfare Department. Duties will be concerned with dental inspection and treatment of expectant and nursing mothers, and young children up to the age of 5 years. In the case of whole-time posts the Officers appointed will be required to devote their whole time to official duties. The salary scale is £800–£50–£1250 p.a., with placement on the scale according to experience. The appointments are superannuable and subject to passing a medical examination and will be terminable by 1 months notice on either side. The remuneration for part-time Officers will be 3 guineas to 4 guineas per session, according to experience. The appointments will be terminable by 1 months notice on either side.

Applications, stating qualifications and experience, with the names of 3 referees, to be sent to the Medical Officer of Health, Council House, Birmingham, 3, not later than 20th March, 1954.

DUBLIN. LOCAL APPOINTMENTS COMMISSION. Positions vacant. THORACIC SURGEONS: (*a*) Limerick Corporation; (*b*) Western Health Institutions Board. Inclusive salary in each case: £1725 with permission to engage in limited private practice. Essential qualifications include (i) at least 5 years experience in the practice of the medical profession at least 3 of which have been devoted to surgical work, including major operations; (ii) M.Ch. degree or Fellowship of 1 of the Royal Colleges of Surgeons or equivalent; (iii) Specialist experience of thoracic surgery. The person appointed to the post under Limerick Corporation will be required to attend the Thoracic Unit, Limerick City Home and Hospital and Ardkeen Chest Hospital, Waterford, and may be required to attend the Limerick Regional Hospital when completed.

Application forms and particulars from the Secretary, 45, Upper O'Connell-street, Dublin. Latest time for receiving completed application forms, 5 P.M. on 26th March, 1954.

HEREFORDSHIRE COUNTY COUNCIL. Applications are invited for Whole-time ASSISTANT MEDICAL OFFICER (Male or Female) in the County Health Department. The duties will primarily consist of work in connection with the School Health and Maternity and Child Welfare Services. Salary £950–£50–£1300 p.a., together with car, and subsistence allowances on County Council scale, which are in accordance with the scheme recommended by Committee C of the Medical Whitley Council.

Forms of application may be obtained from the County Medical Officer, 35, Bridge-street, Hereford. Completed forms of application should be returned within 14 days of appearance of advertisement. R. C. HAN-EN, Clerk of the Council.

NORTHERN RHODESIA. NDOLA MUNICIPAL COUNCIL. Appointment of MEDICAL OFFICER OF HEALTH. Applications are invited from persons who possess the Diploma in Public Health and have had experience in a similar appointment. Salary grade £1700–£100–£2200 p.a., plus a temporary variable cost-of-living allowance of £312 p.a.

Intending applicants should apply forthwith (by air mail post) for further particulars.

EDWARD C. BARLOW, Town Clerk.
P.O. Box 197, Ndola, Northern Rhodesia.

ROYAL AUSTRALIAN NAVY. Medical Officers. Appli-cations are invited from legally qualified medical practitioners for appointment as SURGEON LIEUTENANTS in the Royal Australian Navy. First appointment is for a period of either 2 or 4 years with prospect of transfer to the Permanent Naval Force or alternatively an extension of short service up to a maximum of 8 years with gratuity payable pro rata. Minimum yearly emoluments are married officers £1508, single officers £1294. All money figures quoted are Australian currency, but payment of the above rates will be made in sterling currency until departure from the United Kingdom. "D" grade, first-class passage, including wife and family, to Australia at government expense. A uniform gratuity of £219 10s. is paid on entry. Increment of £54 15s. is payable after 2 years service. On completion of period for which entered a gratuity of £250 will be paid for 2 years service and £500 for 4 years service. If a 2-year commission is extended for a period less than 2 years, gratuity will accrue pro rata. Medical Officers serve in Royal Australian Navy hospitals, ships and establishments in Australia or abroad. Generous leave is allowed, and free travel warrants in Australia to visit next of kin are given under specified conditions. Retirement provisions and invaliding benefits are provided by contributions to the Defence Force Retirement Benefit Fund. These contributions are refunded if taking discharge (other than on medical grounds) at end of short-service Commission.

Full details may be obtained from the R.A.N. Liaison Officer, Australia House, Strand, London, W.C.2, or from the Secretary, Department of the Navy, Melbourne, S.C.1.

LINCOLN. COUNTY OF LINCOLN. Parts of Kesteven. Applications are invited from registered medical practitioners holding a Diploma in Public Health for the joint appointment of ASSISTANT COUNTY MEDICAL OFFICER AND MEDICAL OFFICER OF HEALTH for the Borough of Stamford, the Urban District of Bourne and the South Kesteven Rural District (population approximately 30,314). Inclusive salary for the post is £1368 15s. rising by annual increments (4 of £56 5s. and 3 of £31 5s.) to £1687 10s. Commencing salary according to experience. The appointment will be superannuable.

Application forms, together with terms and conditions of appointment, can be obtained from the Clerk of the County Council, County Offices, Sleaford, to be returned not later than 19th March, 1954. Canvassing, either directly or indirectly, will disqualify. J. E. BLOW, Clerk of the County Council.

County Offices, Sleaford, Lincs, March, 1954.

MONTGOMERY. COUNTY OF MONTGOMERY. Mixed appointment of DISTRICT MEDICAL OFFICER AND ASSISTANT COUNTY MEDICAL OFFICER. Applications are invited from duly qualified and registered medical practitioners who possess a Diploma in Public Health, Sanitary Science or State Medicine for the following whole-time mixed appointment :—

A Medical Officer to act as an Assistant County Medical Officer of Health and as Medical Officer of Health respectively to the following districts :—

The Borough of Llanfyllin, the Borough of Montgomery, the Borough of Welshpool, the Forden Rural District and the Llanfyllin Rural District.

As Medical Officer of Health, the Officer will be responsible to each District Council in the combined area. As Assistant County Medical Officer of Health he will act under the general control and supervision of the County Medical Officer. His duties will be those prescribed by statute or regulation and will be such as are usually attached to such appointments. He should have had experience of School Health Services (including the examination of handicapped children) and of Child Welfare Services, and a Diploma in Child Health is desirable. The salary will be within the appropriate scales, i.e., between a minimum of £1368 15s. and a maximum of £1687 10s. p.a. A motor-car allowance will be paid in accordance with the scales recommended by the Whitley Councils for the Health Services (Great Britain). The appointment of Medical Officer of Health is subject to the provisions of Section 110 of the Local Government Act, 1933, and the Sanitary Officers (Outside London) Regulations, 1935, as amended by the Sanitary Officers (Outside London) Regulations, 1951. It is also subject to superannuation and the successful candidate will have to pass a medical examination.

Forms of application may be obtained from my office and applications, accompanied by 2 recent testimonials and the names of 2 other persons to whom direct reference can be made, must reach me not later than 8th May, 1954.

P. E. WHITE, Clerk of the County Council.

County Offices, Welshpool, 8th March, 1954.

OLDBURY. BOROUGH OF OLDBURY. Worcestershire COUNTY COUNCIL. DEPUTY BOROUGH MEDICAL OFFICER OF HEALTH AND DEPUTY COUNTY DIVISIONAL MEDICAL OFFICER AND DEPUTY SCHOOL MEDICAL OFFICER. Applications from registered medical practitioners with D.P.H. are invited for this appointment. Medical Whitley Council scale salary (£950, rising by £50 to £1300 plus £50 as Deputy).

Application forms from County Medical Officer, County Buildings, Worcester. (M242.)

K. PEARCE, Town Clerk, Oldbury.
W. R. SCURFIELD, Clerk of the County Council.

WALSALL. COUNTY BOROUGH OF WALSALL. DEPUTY MEDICAL OFFICER OF HEALTH. Applications are invited from qualified medical practitioners for the above post at a salary of £1200 p.a., rising by annual increments of £50 to £1450 p.a. Applicants must possess the D.P.H. and should be approved in connection with the ascertainment of educationally subnormal children. Commencing salary according to qualifications and experience.

Applications to be sent to the undersigned not later than 31st March, 1954, from whom further particulars and application forms may be obtained. W. STALEY BROOKES, Town Clerk.

Council House, Walsall.

ROYAL NAVAL MEDICAL SERVICE

Candidates are invited for service as Medical Officers in the Royal Navy—preferably below 28 years.

They must be British subjects whose parents are British subjects, and be medically fit. No examination will be held but an interview will be required.

Initial entry will be for 4 years' short service after which gratuity of £600 (tax free) is payable, but permanent commissions are available for selected short-service officers.

Officers transferred to permanent commissions will be paid a grant of £1500 (taxable) on completion of 1 year's service.

Consideration will be given to the grant of up to a maximum of 7 years ante-date of seniority in respect of approved periods of service in recognised civil hospitals, etc.

For full details apply MEDICAL DIRECTOR-GENERAL, Admiralty, S.W.1.

MIDDLESEX COUNTY COUNCIL. County Health DEPARTMENT. ASSISTANT MEDICAL OFFICER (whole-time) required initially in Area 7 (Ealing and Acton). Duties mainly for supervision of health of mothers, young children and school children. D.P.H. or equivalent an advantage. Salary £950–£30–£1300 p.a. Established, subject to medical assessment and prescribed conditions.

Application forms from Joint Area Medical Officer, Town Hall, Ealing, W.5, returnable by 27th March (quote N. 160L.). Canvassing disqualifies.

CLIFFORD RADCLIFFE, Clerk of the County Council.

General Practice

For an Executive Council post (England and Wales) apply on form E C.16A obtainable from the council. Mark envelope "Vacancy."

CEFN MAWR, near WREXHAM, DENBIGHSHIRE Applications invited for VACANCY (semi-urban) caused by resignation. List approximately 1890. Residence and surgery available for purchase. Applications on Form E.C.16A, to the undersigned not later than first post 20th March, 1954.

TUDOR WILLIAMS, F.C.I.I.,
Clerk of the Denbighshire and Flintshire Executive Council.
11, Grosvenor-road, Wrexham.

Hospital Services : Non-Medical Appointment

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited from Science Graduates for a post of NON-MEDICAL BIOCHEMIST in the Board's Laboratory Service. The main duties are at Craig Dunain Hospital, Inverness, with opportunity for biochemical investigations into mental illness. The post is in the basic grade, and the salary scale for candidates who have completed the probationary period is £585–£30–£765 p.a.

Further particulars and application forms are obtainable from the undersigned with whom applications should be lodged by 31st March, 1954. A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

Miscellaneous

To non-professional posts the Notification of Vacancies Order 1952 applies

Kuwait Oil Company Limited invites applications for the post of Medical Officer to act as Pathologist in the Company's hospital in Kuwait, where the laboratory is well equipped and facilities are good. In addition to qualifications registrable in U.K., candidates must have had charge of a Pathological Laboratory for at least 2 years. Some previous tropical service desirable. Age under 40. Salary according to experience but starting not less than £1500 p.a. clear, plus generous allowances, Pension Scheme and kit allowance.—Write for application form by 31st March, giving brief details and quoting K.1774 to Box D/30, c/o 191, Gresham House, E.C.2.

Manufacturing Chemists near London require the services of a man qualified in both medicine and pharmacy. The duties will be chiefly of an administrative nature and the salary will not be less than £1500 p.a.—Apply, stating age, qualifications and experience, to : Address, No. 907, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Lady requires position as Nurse-Receptionist, London. Experienced in Clinic administration.—Address, No. 904, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Receptionist/Secretary, aged 27, desires post with doctor or dentist in Lincoln area to commence after Easter. Good qualifications. Would accept £300 p.a. to start.—Address, No. 909, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

S.R.N., 25, with Secretarial training and experience, seeks interesting post with London Doctor. Free middle March.—MASON, 153, Bowes-road, N.W.13.

Part-time/full-time consulting-room, Harley-street, to let.—Address, No. 905, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

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PUBLISHED by the PROPRIETORS, THE LANCET LIMITED, 7, Adam Street, Adelphi, in the County of London.
Printed by HAZELL, WATSON & VINEY, LTD., London and Aylesbury—Saturday, March 13, 1954.
PRINTED IN GREAT BRITAIN—Entered as Second Class at the New York, U.S.A., Office.

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